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THE EARLY DIAGNOSIS OF EXTRA-UTERINE PREGNANCY.¹

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No subject in gynecology, if, indeed, in any department of medicine, has made such rapid and substantial progress within the last decade, as extra-uterine pregnancy. Light is finally breaking in upon one of the most intricate and complicated of pathological processes, and by the extension of physiological knowledge, and by clinical observation, that which was an unsolvable riddle to former generations is becoming fully understood. The cause of humanity has gained equally with science. One of the most serious calamities which can happen to woman in connection with the transmission of life, one which is overwhelming in its effects and appalling in its sudden mortality, is at last deprived of much of its danger by the resources of therapeutics and the boldness of modern surgery.

The part which this country has taken in the advance of this subject is cause of pride and congratulation. The clear recognition of the necessity of laparotomy for rupture of the cyst, by Stephen Rogers, of New York,² marks an epoch in the history of the subject. Others had suggested this measure before, but he, more clearly and more vehemently, urged the necessity of this operation upon the profession nearly twenty years before it was executed. Parry's treatise, published in 1876, is another landmark. This gives the scattered knowledge of the times, ad-

¹ Read before the Ohio State Medical Society.

² Trans. American Medical Association, 1867.

mirably collected, presented, and commented upon. The scholarship, the judgment, the critical acumen of this little volume have won the highest encomiums from foreign writers, who have borne testimony to the great loss which medical science sustained by the author's early death. More recently, the application of electricity for causing the death of the foetus, and thus by harmless means rescuing the patient from imminent peril and saving her from the dangers of laparotomy, has given renewed life to the study of the subject. This measure had in this country its earliest successes, and cures by it have since been so numerous that it has conquered for itself a position as a safe and reliable remedy, and as one of the glories of American gynecology.

I fully recognize the fact that a paper presented to an assemblage of practitioners should be based largely upon personal experience, and that doctrine should be illustrated, or theory enforced, by the recital of actual observations. I deplore, therefore, that I have not clinical experience to lay before you. Nevertheless, it is justifiable to present such a paper when the subject is one upon which but very few men have had a great deal of practical experience. Mr. Lawson Tait has had to do, ante- and post-mortem, with about seventy-five cases, yet he never had the opportunity of making an early diagnosis. Dr. Thomas has seen over thirty cases. These are the largest experiences of the world. Winckel, of Munich, all his life at the head of a large obstetrical and gynecological clinic, has met with but thirteen cases. The vast majority of cases of extra-uterine pregnancy have been reported by individuals who never saw one before, or have seen but a few cases. We are with this subject, then, exactly as we are with deaths from anæsthetics. But few men have had the misfortune to see more than one; no one has seen many of them. Still, from a careful study of the single cases, as reported by individuals, much of value has been learned as to the different modes in which the fatal accident occurs, and as to the best means of avoiding it. By such a study of isolated cases of extra-uterine pregnancy I attempt to present one portion of the subject. The whole subject is far too wide for complete consideration, and I limit myself to early diagnosis. My original intention was to take each symptom and note its presence or absence in each reported case, and then tabulate the results. A paper upon this plan would manifestly be complex and extensive, and probably not as useful as one in which the results of a careful study of cases are clearly presented, each symptom which may be present being considered in regular order. Such a paper I have attempted to prepare, impelled by the fact that the signs and symptoms of abnormal gestation are not so fully presented in the text-books as they should be. From the nature of things the majority of cases will fall first into the hands of the general practitioner, and he should be acquainted with the points of diagnosis, that relief may be afforded the patient in due season.

Cases of extra-uterine pregnancy may be classified as follows:

I. A very small number present no well-marked symptoms, and go on to full term; labor sets in, and only then the true state of affairs is discovered.

II. A somewhat larger, but still a relatively small number, are first announced by the symptoms which speedily overwhelm the patient. Rupture of the cyst occurs, and death, by shock and hemorrhage, speedily ends the scene.

III. A large majority of cases, in which marked symptoms are present from an early period. Of these symptoms no single one may be pathognomonic, yet by a concurrence of several of them at once, or by several appearing in succession, a diagnosis may generally be made. It is to these symptoms that I beg leave to direct your attention.

First in order comes the probable existence of a pregnancy. The reflex signs of this condition are present; on the part of the digestive system, depraved or changed appetite, nausea, vomiting, salivation. The breast and nipples show the usual changes. As a general rule, the patient believes herself to be pregnant. This has been the case so frequently that some authorities hold it to be essential. Bernutz and Goupil found this feature absent but four times.¹ When the patient has already had children, her testimony is, of course, more valuable. I know of but one authority who discredits the value of this point in the history of a case. Mr. Tait, in his late work on ectopic gestation, expresses the opinion that no reliance can be placed upon it. Still, at a later period, in making a diagnosis of ruptured cyst, he lays due stress upon the probable existence of a pregnancy when the overwhelming accident occurred.²

There are two points to be noted in regard to the pregnancy. First. In extra-uterine cases a considerable period of barrenness has preceded its occurrence so frequently as to have attracted especial attention. The existence of a desquamative salpingitis, whereby the tubes are deprived of their epithelial lining and brought to a condition similar to that of the interior of the uterus, is maintained by Mr. Tait to be the leading etiological factor in these cases. The explanation seems reasonable and far more probable than that of an obstruction of the tubes. If, then, a patient is pregnant some years after the birth of a child, or becomes so only after several years of married life, the fact should receive due consideration. Second. The ordinary symptoms of pregnancy are likely to be exaggerated, especially those of the pelvis. In the language of Parry, "the pregnancy is a stormy one."

Next in order comes derangement of menstruation. There may be the amenorrhœa which belongs to the ordinary pregnancy, but much more

¹ Clinique sur les Maladies des Femmes

² Brit. Med. Journ., June 28, 1884, p. 1250.

frequently the flow is irregular and it may be excessive, and even continuous. Recurring gushes of blood occur, and, with pelvic pains, often lead both patient and practitioner to believe that an abortion is taking place. There will be often no further doubt upon this point should the decidua be expelled *en masse*; it is taken for a "mole" or "false conception," and looked upon as the termination of a miscarriage.

Examination of the pelvic region reveals, in many cases, great tenderness of one or the other iliac region or of the hypogastrium; there may be so much as to prevent a satisfactory investigation. Great pain at some point of this region may be complained of, and the pain radiates to the loins and down one or both thighs. There may be a febrile condition present and all the evidences of successive attacks of pelvic peritonitis.

A vaginal examination would of necessity follow such symptoms. In a case of extra-uterine pregnancy such an examination shows certain changes in the uterus and the presence of a tumor. The uterus is enlarged, in the earlier period, in proportion to the duration of the pregnancy.

It is displaced; the gestation cyst has pushed it to one side or the other, or forward so that the cervix is found close to the pubic arch. The os is patulous, the finger easily enters it. The uterus is empty. If amenorrhœa is present, the practitioner would, of course, hesitate to ascertain this by the passage of the sound; but when metrorrhagia exists, or the decidua has been expelled, there need be no hesitation. The tumor to be felt *per vaginam* presents some well-marked features which serve to differentiate it from anything else generally found in this locality. It is round, smooth, elastic, giving the sensation of a tense cyst, and, as a general rule, exquisitely tender. It is situated in close proximity to the uterus, yet generally can be made out to be independent of this organ. Two features demand especial attention. 1st. The vaginal wall over this cyst or tumor shows active pulsation; vessels can be felt beating by the finger. This feature was recognized long ago by Baudelocque. 2d. The size of this tumor can be observed to change within a comparatively brief period. The growth of a gestation cyst gives an increase in size more regular and rapid than belongs to any condition likely to be confounded with it. Thomas says it can be noted from week to week.

In addition to more or less of these symptoms, or, possibly, entirely independent of any of them, may come now attacks of severe pain with symptoms of collapse. The patient is found pale, faint, almost or entirely pulseless, with most severe abdominal or pelvic pain. She seems about to die, and the practitioner may be at a loss to account for her condition unless acquainted with the course of this form of gestation. From this collapse the patient may slowly rally, to suffer again in a short period from similar attacks. Different explanations have been given of these

severe paroxysms of pain, accompanied by profound depression of the vital powers. They have been attributed to contractions of the walls of the cyst and to uterine contractions. There is no doubt now that they depend upon partial ruptures of the cyst, or of vessels on its walls, accompanied by a certain amount of hemorrhage. Post-mortem examination of cases in which these symptoms have several times occurred, has revealed a collection of clots, the difference in age of which could be plainly seen.¹ The great practical fact is that a succession of these paroxysms may occur before the final and fatal rupture, which they most surely foretell.

In a patient presumably pregnant, having had more than one such attack as this, and having a tumor to be felt *per vaginam*, there could scarcely be a doubt of the existence of extra-uterine pregnancy. But one symptom more could add to the evidence. This is, the expulsion of the decidua. This membrane may be thrown off *en masse*, when it will be readily recognized. In the case under my observation I drew it on my finger like a thimble. It may be discharged piecemeal. The existence of shreds, therefore, in the uterine discharge of a patient presenting any of the symptoms detailed, should awaken suspicion and lead to a microscopic examination. The expulsion of the decidua is a sign of the highest value, and is, by good authority, even held to be pathognomonic.

Two symptoms may seem to have escaped consideration; they are ballottement and the effects of pressure upon the pelvic organs. They belong to a later period than that to which this paper is limited. Ballottement has been observed by Thomas as early, however, as the third month.² Only exceptionally can it be elicited at so early a period even by a skilful examiner. It should always be sought for; if present, it makes the diagnosis a matter of absolute certainty. Pressure symptoms, of course, become more and more pronounced as the case advances in age.

A diagnosis of extra-uterine pregnancy is to be made, then, by a careful study of the history and of the signs and symptoms of the case in hand. No one of the disturbances it occasions or the changes it causes is of very great weight when standing alone; occurring together, however, the value of each increases in a geometrical ratio. There is an order of occurrence, also, dependent upon the period or progress of the pregnancy which should be borne in mind. The value of a coincidence of the symptoms was recognized by Bernutz and Goupil, who taught that it was by an *ensemble* of symptoms that a diagnosis could be made. An interesting illustration of what is here presented was related by Dr.

¹ See paper by Dr. Johnstone, Journ. Amer. Med. Assoc., Oct. 27, 1888.

² Amer. System of Gynecology, vol. ii.

Hanks, of New York, at the meeting of the British Medical Association in 1886.¹ A gentleman, in a consultation, maintained that the case was one of extra-uterine gestation, but agreed to rest the decision upon a microscopic examination of some discharged membrane. This was reported not to be decidua, whereupon he averred his belief that a mistake had been made. A necropsy soon after proved that he was right. It is stated that the microscopic examination was made by a student.

A summing up of our knowledge upon this subject would seem to be that while in some cases of extra-uterine gestation a diagnosis presents the greatest difficulties, and in a small number it is impossible to make one, in the majority of cases it can be readily done and even more easily and certainly than that of a normal pregnancy. This has been maintained by the very highest authority, both in this country and in Europe.² Moreover, a diagnosis can be made at an earlier period than in a normal pregnancy. It has been made as early as the eighth and even as the fifth week.³

The symptoms which have been detailed may be classified partly in reference to the order of their occurrence, but especially as to their diagnostic value, as follows:

I. *Suggestive*.—*a*. The general and reflex symptoms of pregnancy, especially if the pregnancy had occurred after a considerable period of barrenness.

b. Disordered menstruation, especially metrorrhagia coincident with symptoms of pregnancy; gushes of blood, accompanied by severe pelvic pains.

c. Severe pain in the pelvis; attacks of pelvic pain followed by tenderness in either iliac region, and other symptoms of pelvic inflammation.

II. *Presumptive*.—*a*. The existence of a tumor; this tumor presenting the characteristics of a tense cyst, sensitive to touch, actively pulsating; steady and regular growth of the tumor to be observed.

b. The os uteri patulous, the uterus displaced and empty.

III. *Certain*.—*a*. Paroxysms of violent and overwhelming pain in the pelvis, with general symptoms of collapse.

b. Expulsion of the decidua.

It remains to consider the conditions most likely to be confounded with or mistaken for extra-uterine gestation. They are: abscess of broad ligaments; pelvic hematocele; retroversion of gravid uterus; a small fibroid or fibro-cystic tumor of uterus; a small ovarian or dermoid tumor; a parovarian cyst; tubal disease, as pyosalpinx; pregnancy in one horn of a uterus bicornis; intra-uterine pregnancy. It is not

¹ Brit. Med. Journ., Dec. 4, 1886, p. 1094.

² Among others: Berry Hart and Dr. Aveling, Brit. Med. Journ., December 4, 1886. Winckel, Lehrbuch der Geburtshilfe, 1889. Garrigues, Trans. Amer. Gyn. Society, 1882.

³ Papers by Dr. Janvrin and Dr. Hanks, Trans. Amer. Gyn. Society, 1886, 1888.

necessary to go over these *seriatim*. While each may in some respects closely resemble the disease under consideration, other characteristics, such as rapid growth, paroxysms of severe pain, with a history of probable pregnancy, will serve for a differential diagnosis. Undoubtedly a pregnancy in one horn of a double uterus would present the greatest, if not insuperable, difficulties of diagnosis.¹

The differentiation of extra- from intra-uterine pregnancy is also to be considered. It is most likely to be needed, however, at a later period than that to which this paper is limited. When the pregnancy approaches term there may be such an unusual thinness of the uterine walls that the child seems to be immediately under the skin, and this condition has caused mistake upon several occasions.

The warrant for presentation of this subject, based upon a study of reported cases rather than upon observations, has already been stated to be the necessity of directing the attention of the profession to the subject and laying before them the means of recognizing it. An awakened attention is the first step to diagnosis. In the case which fell into my hands,² I recognized that I had something the like of which I had never seen before, and only realized the truth when the extrusion of the decidua threw a sudden light on the case. And it is interesting to read of cases in which even eminent men were befogged until some new symptoms flashed the truth upon them.³

Still more necessary does it seem to present a careful study of this subject, since doubt has been thrown upon the possibility of an early diagnosis in one of the latest publications upon the subject.⁴ This book emanates from one whose experience is the largest in the world. That with this large experience the author has never had an opportunity of making a diagnosis before rupture of the cyst is indeed a singular fact, as he himself recognizes. But because he has not had this opportunity, it is unscientific, to say the least, to throw doubt upon what other men have done and reported; and the statement he makes that extra-uterine pregnancy presents no symptoms other than, or different from, those of disease of the tubes, finds its negation and contradiction in almost every reported case.

This question of diagnosis has been complicated by that of treatment. To consider the latter is not within the scope of this paper; still, a few words are necessary as to this feature and as to the relation between the one and the other. After rupture of the cyst there is but one remedy—laparotomy. The only hope of the patient lies in prompt and bold surgery. Before rupture, electricity has afforded most excellent results; it can be applied by the general practitioner, and has not shown, so far,

¹ Thomas: Amer. Syst. Gyn., vol. ii.

² Trans. Amer. Gyn. Soc., 1884.

³ See Dr. Lusk's case, Amer. Journ. Obstet., 1881, p. 333.

⁴ Tait: Lectures on Ectopic Gestation.

any evil effects or consequences. Still, there are those who advocate laparotomy as being the best measure even before rupture. Without questioning either their wisdom or their judgment, truth compels the statement that the advocates of surgical methods have displayed a partisanship which does not belong to science. The perils of laparotomy have been belittled, and the possible injurious effects of electricity have been magnified. Not only these, but the diagnosis of cases in which electricity has been successful has been repeatedly questioned, and the capacity of those who have observed them openly doubted. The position has been taken that because ballottement was not observed, or because foetal bones were not afterward thrown off, there was no certain diagnosis. Most of the observations of the successful use of electricity were at a period before ballottement could be expected, and before foetal bones exist. Those who thus doubt are in the position of those who would question a diagnosis of pleurisy with effusion, after recovery of the patient, because no liquid had been presented for inspection. Again, under applications of the galvanic or faradic current the tumor in the vagina has repeatedly been observed to become less tense and less tender, to cease to pulsate, its tenseness diminish and slowly disappear. Coincident with these changes, the sufferings of the patient have abated and she has been restored to health. Simply, the treatment confirmed the diagnosis. How often in another line do we pursue a similar course and accept the results without question. The nature of some tumor or ulcer is obscure; we submit the patient to a course of mercury or the iodides, and the lesion disappears. Its nature is then clear. Therapeusis has not confirmed, but it has made a diagnosis.

I present from Charpentier¹ the following list of diagnostic errors made by eminent men, premising, however, that most of these errors were made at a period which, in a subject upon which our knowledge is so rapidly increasing, may be termed remote:

Huguier, uterine pregnancy taken for extra-uterine; Schlesinger, same; Depaul, extra-uterine pregnancy taken for a fibroid; Dolbeau and Charpentier, extra-uterine pregnancy taken for a retroverted pregnant uterus; Fournier, case misunderstood until the introduction of the finger into the uterine cavity; Martin, tubal pregnancy with hæmatocele, no diagnosis; Boinet, diagnosis halting between ovarian cyst and extra-uterine pregnancy; Hutchinson, similar; Orth, two cases taken for hæmatoceles; Leven, hæmatocele; Capuron, Parent, taken for anteversion; McCallum, tubal, recognized only at autopsy; Walther, pregnancy in a double uterus, sound entered the empty cavity; Jobert de Lamballe, abdominal pregnancy taken for an ovarian cyst or a uterine tumor; Bricheteau, ovarian cyst taken for an extra-uterine pregnancy.

¹ *Traité Pratique des Accouchements*, 1883, t. i. p. 1044.

A STUDY OF ACUTE INFECTIOUS PROCESSES IN BONE.¹

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WITH the introduction of modern methods of biological research, the study of surgical pathology has made a vast stride from the domain of empiricism toward that of true science. It is not too strong a statement if one claims that, in the light of results obtained from bacteriological researches, our whole literature of general and surgical pathology must be rewritten, or so much of it as was published previous to 1885. I do not mean hereby to assume that our present position is in many respects an absolutely stable one, but that our knowledge gained previous to 1885 has been so enriched and extended that it must enjoy a new presentation in order fairly to represent the subject.

Let me not appear, while making such assertions, in an attitude too easily assailed. I am not in sympathy with the class of enthusiasts who are represented (and perhaps misrepresented) as considering bacteriology and pathology as synonymous, or who hold to *bacterio-centric* views, if I may coin the term. Nevertheless, I feel that we stand to-day where we can state without successful contradiction that the introduction of bacteriological studies and methods has revolutionized the principles, as well as the practice, of surgery, and that to their general acceptance is due its *renaissance*.

And now, with this general introduction, permit me to ask attention to a class of surgical diseases whose acquaintance was long since made by the clinician, but whose intimate nature, whose etiology and pathology, it has remained for the bacteriologist to clear up. I allude particularly to acute suppurative periostitis and acute infectious osteomyelitis—the names by which they are best known in this country. Terribly severe in their typical forms, often fatal, bringing dread and despair to patient and surgeon alike, causing the one to endure the torments of the damned and the other often to curse the utter helplessness of his measures, they have been at once the enigma and the stigma of surgery.

But this is no longer the case. Their etiology is now well known; the numerous changes which take place both inside and outside of the bone are pretty well understood, and only the connecting links between easily recognized trains of events are now concealed from our appreciation. And all this has been made possible by modern bacteriological and microscopical technique.

¹ Read before the Philadelphia Pathological Society, April 25, 1889.

Acute osteomyelitis and acute suppurative periostitis are, like tuberculosis, erysipelas, anthrax, and numerous other diseases, infectious maladies which develop under the influence and after the introduction into the system of one or more definite microorganisms. For manifestation of their pathogenic activities they undoubtedly need a predisposing condition of the system, but they are themselves the determining causes. For the recognition of this last fact we are indebted to the bacteriologists. For a demonstration, or further evidence, that they enter through some open pathway, through some lesion revealed or concealed, we must needs study our cases more carefully. We must realize that these conditions may have their origin, for instance, from an ulcerated tooth, or from some other lesion equally easily overlooked.

It is my desire to direct attention to the pathological, rather than the clinical or therapeutical aspect of my subject; and, furthermore, not so much to matters of gross pathology as to the most recent investigations into the truly parasitic nature of these diseases. To this end, let me at once take the position that without the presence of pyogenic bacteria we have no pus; a position which to-day needs no defence.

With this statement for a foundation, it shall be our task to try to make clear the biological position of the parasites to whose pernicious activity these disturbances are due, and to bring out such facts regarding their ports of entry, methods of development, and habits, as time may allow.

Questions to which we particularly need unevasive answers, are:

- I. Is there a specific coccus of infectious osteomyelitis?
- II. Can more than one microbe produce it?
- III. How does any bacterium which can cause it effect an entrance into the system?
- IV. What influences do previously existing diseases exert?
- V. Is there possibility of a mixed infection in these cases, and in what does it consist?

Before attempting to answer these questions, let us secure a little help from a brief historical sketch of the matter.

HISTORY.—As Ivanoff has put it, “Between ‘growing pains,’ so called, which disappear after a few hours of repose, and the intensely agonizing acute osteomyelitis, which has been so justly styled *typhus des membres*, there are very wide differences.” Under this name, acute osteomyelitis, more than one form of lesion has been described, while to the milder form different writers have given a variety of names. Schutzenberger, in 1853, was perhaps the first to call attention to this disease under the name of *rheumatic periostitis*, but during the same year Chassaignac carefully studied the disease and gave it the name by which it is now known. He presented to the Academy of Sciences a classic memoir upon this subject, and, in 1854, another to the Society of Surgery upon “Acute Subperiosteal Abscesses.” While he recognized a wide distinc-

tion between them, he saw also that the two diseases presented certain points in common. In 1858 Becker described the same malady under the name of *phlegmonous periostitis*. Almost at the same time Klose published thirteen cases of this character under the name of *meningo-osteophlebitis*. In these cases he observed epiphyseal separation. About the same time, too, Gosselin published a memoir and described the disease under the name of *epiphyseal ostitis of adolescence*. In 1862 Gamet published a thesis which he entitled "Juxta-epiphyseal Osteo-periostitis." Others also gave it yet other names, among which was that of Giraldes, who usually spoke of it as phlegmonous periostitis. In 1878 Lannelongue published his classical memoir, describing it under the name of acute osteomyelitis of adolescence. It is rather with the acute and suppurative form that we have to deal, consequently I will not follow the history of the recognition and identification of the subacute or more chronic forms.

The gravity of the disease has long attracted the attention of surgeons. Searching for the causes thereof, Recklinghausen, Klebs, and others, examining the different organs of patients dying from the disease, found, in 1874, a micrococcus which they met with in the muscles, heart, pericardium, kidneys, and elsewhere, and which they considered the pathogenic agent, and upon whose recognition they founded various theories—some considering it the specific cause of the disease, others denying it.

Kocher attempted in a systematic, experimental manner to establish the parasitic origin of the disease. He injected various foul and putrid materials, and sometimes succeeded in setting up the trouble, and sometimes he failed. His materials, however, were not derived from pure cultures. Some of them, therefore, must have contained the specific microbes by accident. His conclusions were suggestive rather than conclusive.

In 1880 Pasteur, examining pus from a case of this kind, found also micrococci, which he cultivated, but with which he did not experiment upon animals. In 1881 Schüller, examining a limb amputated on this account, found the same organism in the bone, the periosteum, and the articular cartilages; but Becker was perhaps the first, in 1883, to report complete investigations with these organisms. He isolated and cultivated them upon various media, and then experimented with them upon animals. Injections of these cultures into the abdominal cavity produced peritonitis, but no trace of the lesion. He then made various contusions and fractures subcutaneously, and afterward injected these cultures into the veins; by this means he evoked the ordinary anatomical signs of osteomyelitis. He found them also in the lungs and kidneys, and concluded that he had to deal with a specific cause for the disease. Rosenbach repeated the experiments of Becker and elaborated them. He produced suppuration in the injured bones of animals after having

injected into their veins putrid material or cultures of lactic ferments, consequently he attributed small value to Becker's results. He made cultivations of the same cocci which others had studied and, with Ogston, gave to them the names by which we now know them. It was in 1881 that he cultivated the staphylococcus from the pus of a case of osteomyelitis. In one case he found both the albus and aureus combined; in another the albus alone; and in a third the aureus and streptococcus were found together. He produced the same result by injecting a pure culture of pyogenic microbes from a furuncle of the lip as Struck did with cultivations from osteomyelitic pus.

Krause, in 1884, cultivated from osteomyelitic pus *Staphylococcus aureus* and *albus*, which he found also in the effusion of the joints, occurring as a complication of this disease. He stated that when a bone was fractured subcutaneously, after the injection, he usually observed suppuration at the seat of the fracture, and from this pus the staphylococcus could again be cultivated. He endeavored further to produce a malady analogous to osteomyelitis without effecting such osseous injuries upon the animals. He was forced to the conclusion that there exists a coccus, in cases of acute infectious osteomyelitis, of extraordinary pathogenic and pyogenic powers, which, introduced in sufficient quantities, produces in animals acute infectious disease that leads inevitably to death, and which localizes itself by preference in the organs of locomotion, muscles, joints, and bones. His investigations were corroborated by Garré, who in addition showed that the staphylococcus is also present in such cases in the blood.

Ganglophe and Rodet, experimenting in the same direction, came to nearly the same conclusions, agreeing in the description of the microbes especially at fault; and these are now everywhere recognized by their biological characteristics and everywhere described under the same names. Until recently, opinions have differed as to whether there was a specific germ of acute osteomyelitis alone, which did not manifest pathological properties in other directions, or whether this was a condition which might be called out according to circumstances by various forms. With regard to this question, we shall have more to say a little later.

Rosenbach selected the bone marrow for his experiments, principally for the reason that it is most completely protected from external influences, such as the penetration of exciting inflammatory agents from the skin, or, in fact, from any direction save the circulation. He demonstrated that neither mechanical injuries, comminution nor destruction of the marrow, nor such physical influences as the cautery or the electrical current, nor the action of chemical caustics, could produce a suppurative phlegmon in the bone marrow. He demonstrated further, on the contrary, that this medullary matter was extremely sensitive to the influence of infectious materials, or to rancid butter or products of decomposition,

any of which speedily evoked violent symptoms of septic inflammation. Krause made the further valuable observation that all the common changes noticed in muscles, kidneys, etc., which are met with in pyæmia are found as well in cases of acute osteomyelitis. He observed only those changes at the spot of his experimental fractures which were called forth or met with in cases of ordinary septic poisoning, with this difference, perhaps—that the marrow at the site of the experimental fracture was more extensively involved than after ordinary injection of septic material.

PATHOLOGICAL ANATOMY.—A most important fact was comparatively early established, largely by the French writers, that in acute osteomyelitis the disturbance begins in the neighborhood of the epiphyseal cartilage, and that by early operation (trephining) the presence of pus can be demonstrated in the interior of the bone before it can be found anywhere else.

In the Memoirs of the Society of Surgery, 1855, Gosselin expressed himself as follows:

“When a bone is seized with diffuse ostitis the marrow participates in the inflammation. This marrow becomes highly infiltrated with blood and its vessels congested, plastic material is exuded from these same vessels and a portion of its fatty and albuminoid tissue is mixed with blood . . . Such a mixture of hydrocarbons and albuminoids is certainly one whose putrefaction would most rapidly lead to putrid poisoning, and whose putrid products are situated in a peculiarly favorable position for distribution throughout the system.”

Some of the French authors, in describing the appearance of the interior of the bone, in serious cases of this lesion, have spoken of the medulla as exhaling an odor of infection. Some, like Reynaud, have supposed this to be due to gangrene of the same; others, like Gosselin, believed it due to putrefaction of the albuminoid and fatty elements of the bone marrow. It would appear that both mean practically the same thing, and they dignify it with the term *osteomyelite putride*. Of course, this means, in effect, a mixed infection, the ordinary putrefactive bacteria having also found entrance; or it may be due to the presence of Rosenbach's bacillus pyogenes foetidus or saprogenes.

The macroscopic structure of the parts whose diseases we are studying has no small importance in our present investigation. No one has given this matter more attention than Ollier, and I may be permitted to quote one or two of his observations:

“The connecting cartilage is intimately adherent to the periosteum, with which it is continuous and blended at its circumference. This continuity is well seen in separations of the epiphyses, when the extremity of a diaphysis, separated from its cartilage, breaks through the ensheathing periosteum and protrudes through the tear in the midst of the muscles.” (*Int. Enc. Surg.*, vi. 855.)

Suppurative periostitis is, strictly speaking, endoperiostitis, as Ollier has shown; that is, it is the deeper layer of the membrane which is mainly and principally involved, and the bone must, in consequence, suffer more or less. It may, moreover, be primary or consecutive.

It is probably the cases of endoperiostitis in which the presence of bacteria does not figure, which lead to the rare condition of *periostitis albuminosa*, where a ropy, transparent fluid is met with instead of pus. These are to be regarded as inflammations which have been preserved from bacterial infection. In one instance of this kind that I have met with, neither the microscope nor culture experiments revealed the presence of microbes:

"The activity of the subperiosteal elements explains how the internal surface of the periosteum is also frequently the point of departure for osseous inflammations, which may be limited or may extend. In the latter case they spread all around the bone, and may reach the medulla through the juxta-epiphyseal regions, bringing about those isolations of the diaphysis, or those more or less extensive necroses which so often necessitate our interference." (Ollier.)

Besides these well-known and now commonly recognized forms of parasitic ostitis and periostitis, there is yet another rare one, which, in 1883, Kiener and Poulet described under the name of *ostéite tuberculeuse aiguë envahissante et suppurée*; a species of tubercular ostitis, usually central, of such acuteness that it deserves to be regarded as coming justly within the province of this paper. The greater part of the epiphysis is rapidly invaded and the inflammatory disturbance is most intense. On section, the interior resembles a section of a mass of ice-cream, part vanilla and part raspberry. Small abscesses, even as large as an almond, of yellowish tint, are found in the bone. In the whitish parts the bony partitions are hard, thickened, and the medulla infiltrated with caseous products. The reverse obtains in the reddened areas. If a sequestrum reaches so far as a joint, it perforates the articular cartilage and may fall into the joint cavity, determining there, of course, a purulent and fungous arthritis.

Some time since, I had to disarticulate at the shoulder-joint an arm in which a most typical picture of this rare form of acute disease was presented. At each end of each long bone in the extremity existed the peculiar lesions above alluded to, in their most illustrative form. This was before attention had been called to this peculiar form of disease, and yet my record of the case at the time, and the bony specimens still in my possession, stamp it as a typical case.

Rodet was the first to produce osteomyelitis in animals without inflicting a trauma before or after the injection. This he did by practising intravenous injections. The purulent inflammation, which was usually circumscribed, was commonly located near an epiphysis; it seldom extended over a large portion of the shaft. In many cases diastasis

occurred, and frequently arthritis of the adjacent joint. In the most acute cases the animal died within twenty-four hours, with scarcely any change in the bone. The detection of microbes in the blood was the most difficult. They were most easily found in the kidneys, in which multiple abscesses were often met with. Subcutaneous injection resulted only in local infection; osteomyelitis could be produced only by intravenous injection. Young animals were the most susceptible. As the result of his observations, he considers the medulla, in close proximity to the epiphyseal line, as the primary seat of osteomyelitis of long bones. When epiphyseal separation occurred the pathological fracture was always on the side of the diathesis.

The explanation of these results is not difficult. Cocci may be carried directly to the vicinity of growing bone marrow by direct blood current, or they may be lodged upon a mucous membrane and here cause a local inflammation with local stasis, and then, after causing adhesion of infected leucocytes and local thrombosis, they may be carried along and lodged in some vessel too small to permit their passage. Should accident determine this to be in the bone, then we have the conditions under consideration as the result.

PREDISPOSING CAUSES.—In these cases as in every other acute illness, we find certain conditions of the system which we may consider as predisposing causes. Our most typical illustrations are met with in the adolescent, where, as is well known, there is a maximum of circulatory activity in the neighborhood of the epiphyses. It is not saying too much to claim that where we find the greatest nutritive activity we get our most disastrous results from sudden changes. Let these changes be produced by injury, even slight, or exposure or reflex influences, so that a certain stasis shall ensue, and we can then better imagine how, when once a comparatively small number of pyogenic cocci have gained entrance through the blood channels, they rapidly multiply, causing coagulation-necrosis, and become agents for the most active destruction and evil. Another anatomical fact is of great importance in this connection; the bone marrow is especially predisposed, in composition as in histological structure, to collect and retain germs of disease. It is, moreover, most sensitive in its reactions, and there is further to be considered its now well-known function in the perfect elaboration of the blood. When, therefore, it is attacked, not only is there local disease, but there may be readily brought about serious and rapid alterations in the blood and conditions of true toxæmia.

It is, furthermore, at the age of childhood, as Ollier puts it, "That the action of cold, forced exercise, fatigue of the skeleton, or juxta-epiphyseal strain, give rise, under the influence of a scrofulous or rheumatic predisposition, or of a general systemic poisoning, to those acute or subacute lesions," at points "where increase in length takes place,

and under the periosteum, where increase in thickness occurs." Almost all authors have recognized a predominance of this disease in the male sex. According to Lannelongue, out of one hundred and twenty-two cases, eighty-six were in boys and thirty-six in girls. Many writers unite in mentioning scrofula as a predisposing cause, and this must result not only from the cachexia or diathetic condition which the term scrofula implies, but also from the fact that active scrofulous lesions are tubercular lesions, and that the breaking down of tubercles in bones is a condition of mixed infection, which is simply intensified in activity and abbreviated in time in our most acute cases.

Privation and unhygienic surroundings play also a conspicuous rôle as predisposing to this disease. Whether acute articular rheumatism may be included in this category, is a question not yet settled. When we consider how rare suppuration is in connection with purely rheumatic affections, we may tentatively, at least, leave it out from further consideration.

We are justified in laying great stress on fatigue and exhaustion as predisposing causes.

It is not alone disease nor, in fact, any absolute diseased condition which predisposes to osteomyelitis; bad hygienic surroundings, as will be seen among the children of the poor in crowded cities, long forced marches, even lack of proper rest or of proper food, play almost as large a rôle as do actual injuries. The statistics of wounds among the insurgents of the Commune are sufficiently eloquent in this respect.

I am convinced, with Ollier, that hitherto we have not ascribed enough importance to the matter of juxta-epiphyseal strains in delicate and scrofulous children, as an active factor in producing acute suppuration of the parts. These are produced by falls, or by violent movements, which may be easily overlooked or forgotten. Minute separations, trabecular fractures or hemorrhages are thus caused, which suffice, together with the vulnerability of the system so well recognized in such children, to lead to extensive disaster.

He (Ollier) speaks of the extension or migration of the inflammatory disturbances alluded to from one end of the diaphysis to the other, along the periosteum or medullary canal, sometimes without stopping, and going on to suppuration at both extremities of the shaft, so that we have to deal with two distinct centres of suppuration; and he denominates this *bipolar osteitis*. This is especially common in the tibia, and, I doubt not many of you, like myself, have seen repeated instances of it.

Some French writers have spoken of pericarditis as a predisposing cause. In the writer's estimation, this is more likely to have been either a coincident lesion or a consequence, since the same bacteria are involved in each case. The same may be said of endocarditis. The most active occasional causes are strain, exposure, or excessive fatigue, or all three

combined, especially if occurring in a patient with a tuberculous taint or diathesis.

Inasmuch as the extremities usually suffer most from these causes, it will be seen how easily such circulatory disturbances as partial or complete stasis may be thereby brought about, and how many organisms circulating in the blood may most easily find here a suitable culture-medium, surrounded by fewest disturbing elements. The French surgeons, especially, discussing this topic have shown considerable acerbity as to whether the periosteum or the medulla is first involved. This seems to have been quite unnecessary, if we remember that the bone marrow extends in effect to the very surface of the bone. After all, it is a matter of very trifling importance; inflammation begins at either point, extends rapidly to the other, and, in our worst cases, we have to deal practically with a phlegmonous peri-osteo-myelitis.

Osteomyelitis rarely affects short or flat bones; one meets with very few such cases. There is during the growth of long bones a concentration of nutritive activity, which within certain limits is intense; a concentration made necessary by the necessity for their growth mainly in one direction—that is, length. This growth of long bones in one direction is characterized by a great vascular richness, by a most active proliferation, by much energy in young tissues which are quite delicate, and which are subject to invasion by infectious agents. This may figure as the sole factor in producing acute osteomyelitis, and, though these infectious agents have the power of determining an explosion of disease, as it were, still we cannot be blind to the fact that their activity is prompted alone by the alterations which are so rapidly taking place in the ends of the young bones. The short and flat bones, as well by their situation as by their function, are much less exposed to these alterations; their centres of ossification are not as localized, while ossificatory activity is much milder and less susceptible of deviation.

We are forced to recognize, moreover, cases of acute inflammatory disturbances upon the articular side of the epiphyseal line. In this case care will be required to discriminate between an acute suppurative synovitis and an acute infectious epiphysitis. Inasmuch as intense pain and tenderness, with muscular spasms, will generally predominate early in the latter case, we shall not have much difficulty in this respect. Epiphyseal separations have occurred in cases where this disaster has been veiled in the general features of an acute pyarthrosis.

In a recent thesis Lemoyne has summed up certain conclusions which may be appropriately reproduced here:

“First, that acute suppurative inflammation is frequently met with; second, that it is manifested in two forms, either as phlegmonous periostitis more rarely, or as acute osteomyelitis more commonly; third, that the disease is of an infectious nature, the causes formerly evoked not being sufficient to

explain its development; fourth, that the symptoms in the adult are quite analogous to those in children; fifth, that when inflammation is limited to the deeper layers of periosteum recovery is more likely without necrosis or exfoliation; sixth, that the reparative process is often followed by more or less hyperostosis; seventh, that the prognosis is more grave after the individual has reached the twenty-fifth year of life."

As illustrating the rapidity with which destructive processes may take place, let me quote the following statement by Ollier, made at the first Congress of French Surgeons:

"Rodet has been able to reproduce all the varieties of juxta-epiphyseal ostitis by inoculations with fluid cultures of the *Staphylococcus aureus*. I have had opportunity to examine some of the specimens thus obtained, and in some of them have been able to demonstrate the presence of a sequestrum even so early as two or three days after inoculation."

The usual form of lesion observed by Rodet was rarefying; exceptionally it was condensing.

A case reported by Gerster shows that extensive necrosis may take place in three days after the inception of the disease. He believes, as I do, that a few hours are sufficient to determine its occurrence. Perhaps the most rapidly fatal case on record is that reported by Kohts, in which the disease began and ended apparently in thirty-six hours. (Right femur involved.) The reporter regarded the peri-bronchial tissue as the port of entry in this case. Most painstaking investigation revealed fat-embolism of the lungs, pulmonary infarcts, purulent peri-bronchitis, "myositis mikrococcica;" bacteria were found, as well, in the capillaries of the spleen and kidneys. The peri-bronchitis in this instance was ascribed to a tumble into the water which had befallen the child three weeks previously.

The complications of acute infectious disease in bone are mainly in the direction of septicæmia and pyæmia, except so far as local destruction is concerned. If circumstances permit a reasonably early escape of pus, the final septic disaster may be averted. When this does not occur, and when the surgeon fails to effect an escape of pus and relief of tension, a patient is pretty sure to die of pyæmia. If we are right in speaking of these cases as in the first place a local pyæmia of bone, we shall more readily understand how easily and naturally this result is brought about. As Verneuil has put it:

"Lesions of bone are predisposed especially to severe septicæmia. They prompt and favor continuation and prolongation of dosage of putrid poisoning. The poisonous material is shut in in such a way that escape by way of the vessels and final circulation is almost impossible."

Accepting this view, we can understand both the justness of P. Wagner's expression *kryptogenetische Pyämie* as furnishing a clew to the concealed origin of some previously inexplicable cases of idiopathic pyæmia, and of Leube's *spontané Septiko-pyämie*.

Indeed, the view that acute osteomyelitis sustains a close relation to pyæmia is hardly expressing it strongly enough. It not only leads to pyæmia, but it is, almost from the beginning, a pyæmia. This is to be explained, of course, on the anatomical ground that osteomyelitis is essentially a septic phlebitis of bone marrow, and when we remember the most important rôle played by the veins in the production of the pyæmic condition, we can see how almost immediately an osteomyelitis, regarded in this light, becomes first a local and then a general pyæmic condition.

THERE IS NO SPECIFIC GERM OF THE DISEASE.—Osteomyelitis is, in the light of these and other facts to be adduced, not to be regarded as a specific disease, but as one manifestation of the pathogenic properties of several microörganisms possessing common specific pyogenic activities. It is a phlegmon of bone, or a local pyæmia.

Experiments to ascertain the extent of diffusion of an osteomyelitic microbe have been made by Ribbert. Twenty-four hours after direct injection he found them in all the organs; but later, only in the kidneys. In regard to their localization, three conditions must be taken into consideration: *First*, embolic obstruction of capillaries; *Second*, elimination of pyogenic cocci through the kidneys; *Third*, influence of traumatism. Lübbert entered into a most careful study of the alleged coccus of osteomyelitis, and established for himself its complete identity with the *Staphylococcus aureus*. His monograph also demonstrates the diversity of the lesions caused by this organism. He further showed that *en masse* it was more resistant to elevated temperatures when dry than when suspended in water. When dry it withstood a heat of 80° C. (176° F.) for nearly an hour. Like many other pathogenic microbes, the more it is cultivated in living animals, the more intense, apparently, becomes its activity.

From his biological study, Lübbert was led to the conclusion that the intensity of action of the *Staphylococcus aureus* varied greatly without sufficient cause of variation being known. Inoculation of granulation surfaces proved harmless; even on superficial abrasions it seemed to produce no effect. Subcutaneous injections resulted in the formation of abscesses of varying degrees of severity. Injections into the pleural and peritoneal cavities were oftenest followed by intense symptoms; intratracheal injections produced suppurative tracheitis and foci in the lungs; intravascular injections were followed by septic symptoms, with foci in the intestinal mucosa. Feeding experiments proved harmless. Why the staphylococcus forms should at one time produce a superficial abscess, at another a deep and disastrous phlegmon of bone, and at yet others an endocarditis, a pericarditis, a brain abscess, a purulent synovitis, or any one of many other manifestations of its presence, we can, as yet, only partially answer. When we can formulate an accurate response to this

query we can tell, also, why rarely a subcutaneous fracture suppurates, or why, as in an instance related by Bergmann, a piece of cloth encapsulated in the deeper tissues for fifteen years should finally set up a typical abscess.

Bertoye came to the conclusion that the *S. albus* was less malignant in its action in bones than the *S. aureus*. He thought, moreover, that *S. albus*, after a series of cultivations through living animals, gradually became converted into the other variety, *i. e.*, *aureus*.

Garré's experiment of applying a quantity of pure culture of *S. aureus* taken from a case of osteomyelitis to the unbroken skin of his own arm, and thereby producing a typical carbuncle, shows how it is not always necessary to invoke the hypothesis of a precedent lesion in order to explain the occurrence of a deep-seated phlegmon.

Kraske has also had opportunity to observe a case illustrating the same identity between the microbes met with in osteomyelitis and carbuncle.

The writer's own studies of a few carbuncles have shown him that the *Staphylococcus aureus* is almost always to be met with in this affection, along with other cocci. Out of five cases of osteomyelitis bacteriologically studied by Kraske, the *Staphylococcus aureus* was twice found alone; in the other cases other species were also met with; some of these forms being present probably by accident, and some of them presenting forms not yet identified, whose consequent pyogenic importance is not yet recognized. Kraske takes the ground that the somewhat various features and courses pursued by different cases of osteomyelitis may be, in some degree, at least, owing not only to the presence of the various pyogenic cocci or to their contamination with other forms, but also to the various ways in which infection may have occurred.

A complete recognition of the absolute etiological identity of acute spontaneous and acute traumatic osteomyelitis can only be insisted upon after extensive bacteriological investigations. It may make a difference as to whether the microbe is introduced directly into the bone, as in injury, or by bloodvessels, as in the idiopathic forms. The character of the inflammation may also vary according to the culture medium in which the germ lodges, just as it makes a difference in laboratory experiments whether one makes a needle or a plate culture.

Kraske considers that recurring attacks are not necessarily an indication of former infection, but may arise entirely *de novo*. The results of his clinical studies are, first, the *Staphylococcus aureus* can produce osteomyelitis, and is in fact most frequently met with in osteomyelitic products; second, in a certain number of cases acute osteomyelitis is the result of a mixed infection, and is then most prone to produce a severe case. He thinks that the localization of cocci in the neighborhood of epiphyseal lines in young persons is due to the peculiar location and

arrangement of the capillary vessels in this neighborhood, and that, almost without exception, the inflammatory process has its origin here; that the rapid local spreading of the disturbances is in large measure due to the unyielding nature of the tissues around the primary trouble, and to the fact that the bloodvessels act as direct disseminators, their contents forming the nutrient material for the microbes. Thrombosis is a coincident and necessarily very early condition in every case of acute osteomyelitis. When the microbes reënter the unobstructed vascular channels again, we generally get dissemination and metastatic foci, with coagulation-necrosis of the intima and thrombosis locally. As is well known, in some cases, even of external infection, early in the disease the constitutional symptoms are entirely disproportionate to the local lesions, giving us a clinical picture of intense septic intoxication. This is in all probability an acute ptomaine poisoning, which may possibly be due in its rapidity and intensity to the character of pabulum furnished by medullary tissue.

From some of my own cases that I have tried to investigate carefully I can report the following findings:

I. Case of acute lumbar disease, running a rapid course and terminating in abscess and caries. Found only the *Staphylococcus pyogenes citreus*.

II. Case of acute central osteitis of humerus. Found *Staphylococcus pyogenes albus* and *aureus*.

III. Case of acute necrosis of tibia, following osteoperiostitis. Found *Staphylococcus pyogenes aureus* and *cereus flavus*.

IV. Case of bone abscess of the femur following acute juxta-epiphyseal osteomyelitis. Found *Staphylococcus pyogenes aureus* and *cereus flavus*.

V. Case of acute central osteomyelitis of clavicle, resulting in nearly total necrosis. Found *Staphylococcus pyogenes albus* after cultivation, and tubercle bacilli in the pus, *i. e.*, mixed infection. This case (child) I had operated upon before, having removed the entire lower jaw (a half on each of two occasions) for trouble of similar character.

VI. Case of acute and rapidly fatal osteomyelitis of femur in a young girl. Amputation at hip-joint in desperate attempt to save life. Found *Staphylococcus pyogenes aureus* and *Streptococcus pyogenes*.

VII. Case of acute osteomyelitis of tarsus, with extensive destruction of the same. Found *Staphylococcus pyogenes aureus*.

It falls to my lot to see many cases similar to those above reported, but circumstances have either prevented any examination of the others or my results have seemed not quite worthy of reliance.

The view that each of these conditions is due to a distinct specific form is now well nigh abandoned. For my own part, I have, in a case of puerperal septicæmia, accompanied by ulcerative endocarditis and multiple but apparently not metastatic abscesses, many of them subperiosteal,

recognized the *Staphylococcus albus* by careful culture experiments; consequently I record it as but another expression of specific infection in connection with acute deep phlegmon. We meet also with acute endocarditis which may or may not be fatal. Just such cases have not presented in my own experience, but one may find them recorded, as, for instance, in the thesis of Benoit (Paris, 1876, No. 308).

It is now generally agreed among pathologists that the staphylococci are the causative agents not only in pus production, and its various manifestations as seen in the periosteum and the bone, but also in the production of acute ulcerative endocarditis, as well as of most of the other suppurative disturbances met with in these cases. Furthermore, that they, probably with the streptococci, are at fault when we have to deal with septic infection, whether it appears as sapræmia, septicæmia or pyæmia, and whether it occur apparently spontaneously, or in the puerperal state, or in any other form. I think we may say that we do not at present know a form of this septic infection which can be separated from the presence of these organisms.

STAPHYLOCOCCUS RE-INFECTION.—There seems to be no denying the fact that collections of pyogenic and pathogenic organisms can shut themselves off in certain parts of the system where, as isolated cells of low formation, they remain quiet for months or years until called into activity by some new or special provocation. It is not overstating the matter to claim that isolated collections of pyogenic cocci remain quiescent for long periods of time, especially in the bones, even for twenty years, or longer, then to break out again, as it were, into a conflagration, when anything happens that may permit the outbreak; prolonged exposure, dissipation, or overexertion may bring this about; so may such wasting diseases as typhoid; so may also pregnancy, the puerperal state, puerperal fever, or any other local infection, and so may also such injury as a fracture. There is nothing stranger in all this than that it is strange that grains of corn or wheat may be kept for decades or centuries and then, under favorable auspices, once more resume cell activity and cell proliferation. This statement finds many clinical illustrations, as when we have occasion to remove sequestra from limbs which show many old scars of old bone abscesses, or when we even have to amputate for destruction too extensive to permit milder measures.

In fact, in most cases of osteomyelitis in the adult we shall find, as Lannelongue has told us, vestiges of similar trouble dating back to childhood or infancy.

I have recently had in my own practice a case where I had to amputate a thigh for acute necrosis, resulting from acute osteomyelitis, where the last outbreak of bone trouble of which I could get any account dated nearly twenty years previous. I feel as confident with this case as I do with anything which I cannot demonstrate, that a collection of

microbes of years' standing had been excited into activity as the result of overexertion and prostration. So, too, Volkmann says:

"I have already observed five or six cases where patients who had suffered from acute periostitis or osteomyelitis, and who exhibited extensive bone scars, have been suddenly seized after ten, fifteen, even twenty years, with acute diffuse inflammation which proceeded from their previous disease, and exhibited a peculiarly severe destructive character. Four of these patients died; two of them of acute pyæmia; in one case amputation of the thigh was necessary."

Gerster has reported a case of apparent quiescence of forty-seven years between the attacks, the disease recurring after this period at the same spot.

Rosenbach emphasizes the comparatively long period of time during which cultures remain active, and calls attention to the clinical manifestations of this fact in that suppuration may be resumed in bones, at points where previous lesions had existed, long after the original disease had apparently subsided.

Were it worth while, I could give many other illustrations of this clinical feature from my own practice, including several in which limbs have had to be removed to secure relief.

Kraske makes the important point that by no means every case of recurring osteomyelitis is really such; quite a large proportion of them depend upon a new infection, determined by certain changes in the bone marrow, which later, at an age when the disease is most common (period of youth), predispose to fresh inoculation. The rest of these cases undoubtedly are connected with the long period of quiescence to which I have already alluded.

PORTS OF ENTRY.—Observers have long noted the coincidence of osteomyelitis with various excoriations, abrasions, wounds, and superficial or deep lesions, but without drawing, until lately, the conclusion that the osteal lesion was the result of infection through these channels. Chassaignac was the first to trace a causative relation, as he did in the case of a boy whose ankles had been chafed by his boots and who had a very severe osteomyelitis of the right femur. Several of the earlier observers in this direction have remarked their cases occurring in those who have recent or older scars. Camps has called attention to the fact that in cases involving the phalanges small lesions about the fingers have usually preceded. And so osteomyelitis of the lower jaw frequently follows some local affection, usually from inside the mouth.

A point of the greatest importance, therefore, is to recognize, if possible, the path of infection. As we understand it to-day, infection may occur through the skin, through the respiratory and circulatory organs, through the mucous membrane or intestinal canal, and through injury by direct penetration.

It is more than possible that the source of infection in acute osteo-

myelitis may be a suppurative focus upon or just beneath the skin, and that this, even, may be so minute as to be unrecognizable. A furuncle of the lip has been known to be the exciting factor in such cases as this.

In fact, Kraske is of the opinion that in the majority of cases the infection proceeds from the skin or the subcutaneous areolar tissues. Kocher had already called attention to his so-called secondary osteomyelitis, and the fact that in seeking for its cause one must not forget to examine carefully the entire surface of the body, and next to this the lymph glands, just as in a large portion of the formerly so-called "scrofulous glands" one could discover almost always some epithelial defect through which infection could take place, and from which swelling and suppuration of the glands ensued.

It is important in this connection not to overlook the tonsils as the possible seat of infection, since more than one observer has found their tissues more or less loaded with the *Staphylococcus aureus*, and Kraske considers it quite possible that a general infection may follow the growth of staphylococci in these glands.

The recent thesis of Ayala-Rios contains some carefully reported cases showing how osteomyelitis has followed, in one case, chilblains; in a second, felon; in a third, chafing and abrasion of the scrotum and groin; in a fourth, abscess; injury to head in a fifth; chafing and lymphangitis in a sixth; and furuncle, aphthous ulceration of the mouth, and other ordinarily mild and superficial bruises or lesions in yet others. In seven (*i. e.*, one-half) of his cases the serious osseous disturbance seemed to be in close relation—in point of locality—with the point of entrance of the microbes; in the other seven this close relation did not obtain.

Gerster has reported a case of extensive rapid destruction of one ischium with extensive purulent infiltration, the patient having had chronic suppuration in the middle ear.

Kraske asks the question, "Is it possible or probable that osteomyelitic infection may result from the alimentary tract?" Kocher has been decidedly of the view that this is possible. The infrequency of such infection is, of course, only negative. We know that both anthrax and tuberculosis can be produced by the ingestion of infected food. The peculiarity of Kocher's experiments may, perhaps, prevent us from completely accepting his views, and yet we cannot contradict the evidence of his two cases, in which he seems to show clearly that the intestines were the source of infection. We are in position, then, rather to say that the intestine is a possible source of infection than that it is a well-known source. Much more probable is infection through the lungs, and, consequently, the circulation. We are as well aware, of course, of the transfer of organic cells as of inorganic material from the respiratory organs to the bronchial glands; this being the fact, the general or more distant local infection is generally a difference in degree.

In a case of acute osteomyelitis two paths of exit are open for the pus: one by way of the joint, the other through the periosteum—the latter being the more frequent. It is, in fact, cases of the latter variety, where the pus forms in the middle of the long bones, which have led to the error of mistaking many of these for cases of simple acute suppurative periostitis. Such a case will be presented to a surgeon for the relief of what is supposed to be a simple subperiosteal abscess with, perhaps, superficial caries, but which will be found to be a case of deep central lesion. In the past few weeks a young lad was brought to my clinic whose case had been regarded as simply one of acute periostitis. I learned that he had suddenly been seized, in September of last year, with severe pain in one leg, which rapidly became intense. His case was for two or three weeks a very serious one; his fever was high, he was delirious much of the time, and even his life was despaired of. Later fluctuation was detected, a small skin opening was made, and pus evacuated. After this his most urgent symptoms subsided. When brought to me, the latter part of March, I found four sinuses, near the middle of the tibia, discharging small quantities of pus; upon operation it was found that nearly total central necrosis had taken place, and it was necessary to remove, subperiosteally, nearly all the bone from one epiphysis to the other. Surely, no ordinary case of periostitis alone could bring about such deep and central destruction of bone as this case presented.

This was an illustration of perforation of pus through the periosteum; on the other hand, we find either epiphyseal perforation with formation of extra-articular abscesses, or direct perforation of pus into the joint, with consequent necrosis and destruction of more or less of the joint structures, and permanent loss of function providing that life be spared. The discovery of pus in a joint-cavity, in such cases, is not necessarily a sign that it has perforated from the medullary cavity. It may be empyema of the joint consequent upon the presence of pus in the neighborhood, as we find ordinary empyema after acute specific process in the lungs proper, or it may be an expression of a metastatic process, in which case other manifestations of the same will probably be detected.

MIXED INFECTION.—We have two forms of mixed infection complicating acute suppurative changes in bone and periosteum, which certainly deserve brief special consideration. These comprise the typhoid and the tubercular. Whether the syphilitic properly may form a third we cannot yet say. The tubercular form I have already alluded to when speaking of the clinical manifestations described by Kiener and Poulet. Not less interesting are the acute disturbances in bone consecutive to typhoid.

Ponfick's researches concerning sympathetic affections of bone marrow after internal disease constitute most interesting reading, and are well worthy of study in this connection. They show how a large number of

infectious diseases such as typhus, typhoid, intermittent fever, continued fevers and the like, determine changes in the bone marrow which are anatomically recognizable. This being the case, we can easily see how slight a provocation in the way of septic infection is necessary to set up acute and disastrous suppurative changes.

Typhoid bacilli have been found at wide distances from the intestinal canal; Gaffky has found them in the liver; Bouchard has met with them in the urine and in the kidneys. They have been found in hyperæmic lungs along with other bacterial forms. They have also been seen in connection with other lesions in furuncles, in bedsores, and in connection with other septicæmic lesions.

Whether the specific bacillus of typhoid is properly to be ranked with the true pyogenic bacteria, or whether its lodgement and the changes incident thereto simply predispose to a mixed infection with the staphylococcus or streptococcus, is a question, in my estimation, hardly yet to be positively answered. I do not forget that, for instance, Fränkel in 1885 carefully studied a case of post-typhoid abscess of the abdominal wall, from the pus from which he cultivated typhoid bacilli and these only. His case certainly demonstrated that the typhoid microbe could remain in the body longer than was ordinarily supposed (four months in this case), and it would seem to show that rarely it can manifest true pyogenic properties; still, such an investigation needs confirmatory evidence.

Of no small interest in this connection is a recent paper by Ebermaier. (*Archiv für klinische Medicin*, Bd. 44, Heft 2.) In two cases of periostitis, occurring as a complication of typhoid fever, he was able to prove the presence of the typhoid bacilli in the pus and blood present. The first case was in an eighteen-year old lad, in whom, on the thirteenth day of the disease, signs of a periostitis of the second metatarsal bone of the left foot appeared. On the twenty-first day fluctuation was present, and the abscess was opened. Examination of the pus showed the presence of a few typhoid bacilli, and cultivation confirmed the microscopic result. The second case was in a nineteen-year old seamstress, in whom a periostitis of the right tibia developed during convalescence. The affected spot was incised; no pus obtained, but much blood. Cultivations obtained from this gave the typhoid bacilli. In neither were any other microorganisms found. He gives six other cases of periostitis occurring during the course of typhoid fever, one of which went on to suppuration; he thinks that the results obtained from the first two cases allow us to consider the typhoid bacilli as their causative agent. He considers that the bacilli reach the periosteum from the medullary part of the bone through the Haversian canals, and is led to this belief from having obtained cultures of the typhoid bacilli from the medullary part of a rib removed post-mortem from a fatal case of typhoid fever. Whether

this affords all the evidence needed each one of us must determine for himself.

At all events, I can state of my own knowledge, not all post-typhoid abscesses contain such pure cultures of typhoid bacilli, since in at least one such case I have been able to cultivate the common *Staphylococcus aureus* from the pus, along with the bacillus in question.

Post-scarlatinal abscesses are certainly usually mixed infections, providing the alleged germ of scarlatina has aught to do with them, since in cases of this kind, too, I have found nothing but the common pyogenic forms, even after careful plating. When we know positively what micro-organism it is that produces scarlatina, we can speak with more certainty about mixed infection in this connection. So, too, with the other exanthemata. Rarely we hear of cases of acute bone trouble following after variola.

In the *Archives of Medicine* for 1830 (vol. iv. page 491) there was reported by Ancell a case of a babe of eleven months suffering with smallpox. An eruption appeared, discoloration commenced on the tenth day; upon the eleventh day the infant showed signs of distress; various swellings occurred in the neighborhood of the joints; fluctuation soon followed, with dilatation of superficial veins; fresh swellings appeared, crepitation was noticed in the joints and on pressing the fingers; even the costo-vertebral joints presented crepitant tumors. After death diastasis of most all of the epiphyses was noted, while the various joints were filled with pus.

In closing, let us now see to what extent we can answer the questions propounded at the beginning of this paper. I think we shall be perfectly safe in adopting the following conclusions:

I. There is no one specific microbe for the production of acute infectious processes in bone.

II. Most, if not all, of the staphylococci can cause them. Exceptionally, the streptococci may exert such an influence. So may tubercle bacilli and those of typhoid.

III. Commonly, when these latter are met with, we have to deal with a mixed infection, the pyogenic cocci being the final and active destructive agents.

IV. Of all forms, the *Staphylococcus aureus* is the most pernicious.

V. The parasitic infection may occur through the ears, eyes, nose, mouth, pharynx, respiratory passages, mucosa of the alimentary canal, or skin; or, in other words, through any lesion of the external or internal body surfaces. Furthermore, from any subcutaneous phlegmon, however small.

VI. The infection need not necessarily have been recent. The staphylococci and the bacilli of tubercle have the property of hiberna-

tion, so to speak, and their period of latency is one of almost indefinite length; this is especially true of the former.

VII. Some predisposing condition will be usually found to have favored the entrance of the infectious germs into the system and their lodgement in the localities where they manifest most activity.

VIII. Of the general causes which favor their entrance the diathetic conditions, such as the tubercular, and the dyscrasial, like the syphilitic, also the post febrile, play a most conspicuous part. Age, *i. e.*, childhood, is also always a predisposing cause.

IX. Of the causes which favor lodgement in particular localities, exposure, exhaustion, strain, and more marked traumatisms are those usually met with.

X. Pathologically, a case of acute infectious osteomyelitis becomes within a few hours a case of localized pyæmia, with all that the term implies; and this within a few hours more may become so generalized that a patient may die, even within thirty-six hours after noting the first symptom, of overwhelming septic intoxication.

XI. Acute infectious periostitis may run almost as acute a course, locally, as the same grade of osteomyelitis; but, inasmuch as pus finds more readily an outlet, it seldom leads to as rapid general disaster.

XII. A final conclusion in a therapeutic direction may, perhaps, be permitted here. No matter how former surgeons, like Demme and Chassaignac, disputed the matter, there is to-day but *one* safe and rational treatment, and that is, early and radical operation. These cases have been too often considered to be acute rheumatic affections, and many lives and limbs have been sacrificed to this diagnostic error. Our books and teachers need to give more exact instruction in this respect. When students are taught to recognize early the gravity of these conditions, they will learn that which, in many schools at least, they are not taught to-day. And now that we no longer dread as we did a combat with these insidious and invisible foes, there is no longer any reason for hesitating to operate early, since it offers our sole and almost only hope. Early, radical, and antiseptic attack constitutes, then, the therapy of the diseases to which I have invited your attention.

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CONGENITAL TUBERCULAR MESENTERIC DISEASE AND SUB-DIAPHRAGMATIC ABSCESS.

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THE comparative infrequency with which congenital diseases, other than syphilitic, are found, and the difficulty so often experienced in discovering in a subject so young the exact nature of any ailment from which it is suffering, and, in case of a fatal termination, in obtaining an

autopsy to confirm the correctness or otherwise of any diagnosis made during life, make a case such as that about to be recorded of peculiar interest.

N. B., female, was seen by me when it was twenty-eight days old. The child had from its birth been extremely restless, never sleeping at any time for a longer period than half an hour. The mother had entirely fed the child for the first three weeks, but after that time cow's milk, diluted with water, had been substituted on account of an opinion having been formed by those nursing it that the maternal supply disagreed. That belief was founded on the fact that the child's motions were invariably hard, greenish, and curdy, and that flatulency was very troublesome. The belly had from birth been tumid, but this had been attributed to the presence of a large amount of flatus; for, whenever the child cried or appeared in pain, friction over the abdomen seemed to relieve it, and flatus escaped. Castor-oil, dill-water, and lime-water had occasionally been given to relieve symptoms, but still the condition of unrest persisted.

When first seen the most noticeable feature was the great distention of the belly; it was universally tympanitic, and the tension so great that it was impossible to map out with any accuracy the position of any of the internal organs, or to explore its cavity. The only points discoverable were the presence of a little more fulness and resistance to touch in the right hypochondriac region, and the manifestation of more pain there than elsewhere in palpation. There was no enlargement of the superficial veins, and no rise of temperature. The motions were unhealthy in character, and for about twelve hours had been somewhat watery, but there was no sediment of shreddy matter, or traces of blood-clot. There had been no sickness except on one occasion; the tongue was clean and moist, and food (diluted milk with lime water added) was taken readily.

In the course of a week the belly became enormously swollen, percussion eliciting a tympanitic sound; the superficial veins were prominently visible, and there appeared at the navel a faint blush of redness; there was no fluctuation. The motions were now much more healthy and not loose, and a sufficiency of bile was present in them; but some pain was usually manifested before the passage of either flatus or stool.

During the next fortnight the umbilicus became swollen, its redness increased, and some superficial fluctuation was detected immediately below it; the child exhibited no pain in palpation unless pressure was made on the right side in liver region. Food was taken with increasing difficulty, and pallor, accompanied by wasting, was apparent. At this time (the child being fifty-one days old), while an examination of the abdomen was being made, pus oozed out at the navel, and, on pressure, three ounces were evacuated, creamy and laudable in character, and subsequently during the day about one ounce more. After this discharge there was subsidence of the swelling below, but not above, the umbilicus, and the blueness of the superficial veins became less; but pain was still evidenced on pressure in the right hypochondrium, and slight but transient strabismus was observed. The child's condition underwent no amelioration; food was administered with much difficulty; pallor increased; very little sleep was obtained, and, after the lapse of three days from the bursting of the abscess, death ensued, a convulsion

having occurred an hour previously. The child at death was fifty-four days old.

On making a post-mortem examination there was found on the right side beneath the peritoneum a large sub-diaphragmatic abscess, containing nearly three ounces of pus, which had burrowed down thence to the umbilicus, between the peritoneum and the deep surface of the abdominal muscles. The parietal layer of the peritoneum on the right side was much thickened. The root of the mesentery was invaded with caseated glands, and there were numerous enlarged glands along its attached border. The internal organs were all healthy, and there was no lymph coating the intestines.

The occurrence of tubercular mesenteric disease and sub-diaphragmatic abscess in a child a month old is probably without precedent. The history, however, of this case appears to show that the disease was congenital, and that the child at its birth had either the abscess commencing, or, at any rate, caseous mesenteric glands. That supposition receives confirmation from the fact of there having been persistent unrest, colicky pains, unhealthy motions, and tumid belly observed from the very earliest period of its existence.

Dr. Eustace Smith (*Disease in Children*), in referring to the scrofulous diathesis, states that "a child who has the misfortune to be born with this unhappy predisposition is liable to very widespread evidences of the constitutional fault with which he is burdened. . . . These manifestations of the constitutional tendency usually take place early. . . . Infants, indeed, are in a great measure exempt from its attacks; but after the third year it begins to be common." The same author (*Wasting Diseases of Children*) further writes: "setting aside the general rarity of mesenteric disease, and its extreme rarity in children under three years of age. . . ." Dr. Angel Money (*Diseases of Children*), in describing tubercular abdominal disease, states that "the child is usually in the second period of dentition." Dr. Wood (*Practice of Medicine*), in his article on disease of the mesenteric glands, writes: "This disease is confined to no period of life, having been observed in the fetus of six or seven months, and in old age; but it is most common in childhood. By far the largest proportion of cases occur between the ages of one and ten years."

Dr. Ashby, of Manchester, who saw the case in consultation with me, mentioned that the youngest child he had seen with an abdominal abscess, the result of tubercular peritonitis and mesenteric disease, was four years old.

Mesenteric disease appears to be a little more common in girls than in boys. Guessent states that, in the Hôpital des Enfants at Paris, where no one is admitted under one year or over sixteen, the proportion of tubercular mesenteric cases to the whole number of deaths may be,

for boys, five or six, for girls, six or eight per cent. (*Dict. de Méd.*, vi. 436).

With regard to the case here reported, none of the symptoms displayed during the first month necessarily characterized mesenteric disease; they were such as might be ascribable to flatulent distention arising from functional derangement of the stomach or bowels, or both. On this point Dr. Eustace Smith (*Introduction to Wasting Diseases of Childhood*) writes: "The large size of the belly in weakly children often attracts the attention of parents, and excites much anxiety. It is most commonly produced by accumulation of flatus, owing to the weakness of the abdominal walls." And again, "Distention of the abdomen is by no means a necessary consequence of this disease (*tabes mesenterica*). On the contrary, unless the glandular disease be great, the abdominal wall is more often retracted than expanded. It may become occasionally distended from flatus, as in all cases where the bowels are disordered, but the distention is, in such cases, independent of the affection of the glands, and is merely an accidental complication. . . . In all cases, therefore, when the belly is swollen uniformly, the probabilities are very strongly against mesenteric disease; and if no tumor can be detected on pressure in the situation of the glands, no foundation exists for attributing the enlargement of the abdomen to this cause."

Dr. West (*Diseases of Infancy and Childhood*) writes, "When the digestive organs perform their functions ill, nothing is more common than for the abdomen greatly to exceed its natural size."

At birth, and until a fortnight before death, the child's nutrition was not materially impaired, and it did not look ill. Dr. Eustace Smith (*Wasting Diseases of Children*), under caseation of mesenteric glands, states that "in cases where the disease is moderate in amount, and is confined entirely to the glands of the mesentery without being complicated by any chronic lesion of the bowels, nutrition may be little, if at all, affected. The child may show a fair amount of flesh; his spirits and appetite may be good; his temperature natural, and with the exception, perhaps, of a slight want of color, there may be little in his appearance to suggest a suspicion of ill health." It was only when the distention of the belly became so marked, and the superficial veins so visible, that grave suspicion arose as to the presence of mesenteric disease. On this point Dr. Eustace Smith, in the same work, remarks: "If this venous dilatation be very marked, the superficial veins being distinctly seen to ramify upon the abdominal wall, and to join the veins of the chest-wall, enlargement of the mesenteric glands should always be suspected, in the absence of chronic peritonitis or disease of the liver, but nothing more than suspicion is allowed by such evidence."

In many cases of tubercular disease of the mesentery, the symptoms are very ambiguous, and there is difficulty in detecting by palpation

that which is the most reliable indication of its presence—viz., the existence of enlarged glands or nodular masses, on account of their depth.

Dr. West (*Diseases of Infancy and Childhood*) writes: "There is no symptom pathognomonic of tubercle of the mesenteric glands, except their being perceptible through the abdominal parietes." In this case, the difficulty of diagnosis was rendered exceptionally great from two causes: first, the very early age of the child; second, the extreme tension of the abdomen from tympanites. As to the first, peritonitis was much more likely to have existed than tubercular disease, on account of its greater frequency in early infancy. In Owen's *Surgical Diseases of Children*, the following paragraph from Ziemssen's *Cyclopædia*, vol. viii., appears: "In 186 cases of peritonitis in children, 102 occurred within the first fortnight, 63 in the third and fourth weeks, and 15 were over a month old." In this case, however, the relief afforded by friction—which was well borne—and the absence of an elevated temperature negatived the supposition of peritonitis.

Demme has described a case of tubercular disease of the intestine in an infant twenty-nine days old. As to the second, there are other diseases which might have occasioned the enlarged belly. Dr. Goodhart (*Diseases of Children*) mentions that both Hillier and Rilliet and Barthez allude to cases in which cancer of the abdominal viscera caused some difficulty in diagnosis—one in the pancreas, the others in the kidney. He also states that large tumors of the kidney are not uncommon. Dr. Eustace Smith, too (*Wasting Diseases of Children*), writes: "The liver and spleen may be themselves enlarged; and great masses of cancer occasionally spring from the kidney and from the other abdominal organs."

An examination of some of the symptoms observed, but obscure, during the life of the child, was afforded by the situation in which the abscess was found, as, for example, the persistency with which pain was evidenced when pressure was made in the right hypochondriac region, the subsidence of swelling below, and not above, the umbilicus after the escape of pus; for it is reasonable to assume that an immense abscess, such as this unquestionably was, interposed between the diaphragm and the liver, would force down the latter organ, and that when a large quantity of its contents was liberated the liver would again resume its normal position, and thus tension below the navel would be lessened.

As to the cause of the disease in this case, no evidence of constitutional disease was exhibited in either of the parents. The mother, during the whole period of gestation, was remarkably healthy and well nourished. There was, however, a not very clear history of tubercle in the family, although a cousin of the child was known to have enlargement of the cervical glands.

A CLINICAL STUDY OF PARALDEHYDE AND SULPHONAL.

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As the value of the new hypnotic sulphonal is still being tested, an account of a clinical comparison between it and paraldehyde may perhaps add something to our knowledge.

The very favorable experience of Cramer and others with the drug, together with the statement of Rabbas, "that it is more desirable than amyl hydrate or paraldehyde," led me to use it and the latter drug quite extensively in the insomnia of mental disease, with the view of determining more accurately their relative worth and the kind of cases to which they were especially adapted, and in which they could be used with the best hope of success and with most benefit.

The observations which are the subject of this paper extended over a period of six months, beginning Nov. 1, 1888. During this time paraldehyde was used in 100 cases, and sulphonal in 166 similar cases. Each drug was used in 20 cases of acute and chronic disease in which the insomnia was due to other than purely mental causes. The patients to whom either drug was administered were watched by competent nurses, and the exact time of sleep noted, and all these results carefully recorded. The standard of success was the same with each drug, and was as follows: From six to nine hours was counted a successful trial, from three to five hours a partially successful result, and under three hours a negative effect. The dose used varied with the age, sex, and condition of the patient and with the intensity of the insomnia; in the case of paraldehyde, from one to two and a half fluidrachms, and sulphonal from gr. xv to one drachm. The after-effects were also recorded as they occurred.

First let us study the result of paraldehyde in 100 cases, 48 males and 52 females, embracing nearly all the varieties of disease of the mind, as follows: acute and chronic melancholia, acute and chronic mania, the various dementias, periodic mania and circular insanity, general paralysis of the insane, alcoholic mania and primary dementia.

In 25 cases of chronic dementia (including all its varieties excepting epileptic), 1021 trials were made, an equal number in each case. These cases of insomnia varied from simple wakefulness to the noisy unrest of the terminal dement. Of these trials 834, or 81.7 per cent., were successful, 12.7 were partially so, and 5.6 per cent. were negative.

In 11 cases of chronic melancholia habitually sleepless, 397 trials were made, with success in 67.2 per cent., partial success in 23.4 per cent., and failure in 9.3 per cent.

In acute melancholia, in the first month of the disease, 139 trials were

made in 6 cases, of which 81.2 per cent. were successful, 7.1 fairly so, and 11.5 per cent. negative, while all of the cases were markedly benefited by its use.

In epileptic dementia 66.9 per cent. of 372 trials in 7 cases was successful, 25 per cent. partially so, while but 8.1 per cent. were negative.

Out of 1080 trials in 27 cases of chronic mania all markedly sleepless, and many accustomed to other hypnotics, 57 per cent. were successful, 25.6 per cent. fairly so, while 17.3 per cent. were negative.

In acute mania 66 per cent. of 198 trials in 10 cases, 4 males and 6 females, were successful, fairly so in 14.5 per cent., and entirely negative in 25.5 per cent. of the trials made. Two of these cases were not influenced at all by the drug.

In the wakeful and restless states of the second and third stages of general paralysis of the insane 62.6 per cent. of 193 trials upon 7 cases, all males, were successful, 26 per cent. partially so, while 11.4 per cent. were negative.

In 5 cases of periodic mania (one was a case of circular insanity), all in the stage of excitement, 109 trials were made, with success in 59.6 per cent., partial in 27.5 per cent., and negative effect in 12.8 per cent., while 23 trials in a case of primary dementia with great restlessness resulted in success in 86.9 per cent., while only 4.3 per cent. were negative, and the remainder doubtful results.

From this we learn that paraldehyde was of most service in the insomnia of the dementias, of least service in acute mania, and that its efficiency is nearly equal in acute and chronic melancholia and epileptic dementia; also that it was less serviceable in the insomnia of the maniacal states than in melancholic conditions,—for only 57 per cent. of trials in chronic mania were successful. Strange to say, in periodic mania it failed in only 12.8 per cent., while in acute mania the percentage of failures was 25.5 per cent.

Summarizing these statistics of its use, we find that of the 3515 trials made upon these 100 cases, 2407, or 68.5 per cent., produced from six to nine hours' sleep; 711, or 20.2 per cent., from three to five hours; and 397, or 11.3 per cent., failed utterly to produce sleep.

Besides the foregoing cases, paraldehyde was used in 20 cases in which the insomnia was not due to a mental condition, but was a symptom of some acute or chronic disease. These cases were made up as follows: phthisis, 2; erysipelas, 6; acute rheumatism, 3; pneumonia, 3; cerebral gumma, 1; typhoid fever, 1; painful leg ulcer, 2; cellulitis of arm, 1. To these paraldehyde was given 267 times, with success in 50.9 per cent.; partial success in 19 per cent.; and complete failure in 30.1 per cent. of trials.

Following the example of H. B. Williams, M.D. (Assistant Physician,

Arkansas Insane Asylum), I have also employed it in epilepsy and in the status epilepticus, but with no encouraging result.

Leaving paraldehyde for the present, we will consider its newer rival, sulphonal. The clinical data of this new chemical are already getting numerous. I will refer to the following: Cramer had 92.6 per cent. of "positive success" in 92 insane cases, with "no instance of any unpleasant after-effect." Schwalbe had, in 66 per cent. of 50 cases, a "prompt and satisfactory effect;" while, in 24 cases of purely nervous insomnia, 90.3 per cent. of his trials were effective. Rabbas employed it 200 times with "good effect." Papers have also been contributed by Kast, Ziemssen, Oestreicher, Schmey, Fränkel, Rosenbach, Rosin, Salgo, Mathes, and others. Schmey asserts that it is dangerous in arterio-sclerosis, and Mathes and Ziemssen admit unpleasant after-effects in 19 per cent. and 20 per cent. respectively; yet the great weight of their united testimony is in favor of sulphonal; while Kast says that it does not affect pulse or respiration, and that only very large doses lower the blood-pressure (*Amer. Journal Med. Sciences*, July, 1888).

In this country papers have been written by W. H. Flint, M.D. (*New York Med. Journ.*, December 15, 1888), H. M. Wetherill, M.D. (*Med. and Surg. Rep.*, October 13, 1888), Sachs (*Med. Record*, October 6, 1888), Wilson and Hutchinson (*Med. and Surg. Rep.*, June 9, 1888), and others. Dr. W. H. Flint had success in 82 per cent. of his trials in 33 cases. He recommends it especially in the insomnia of debility, and in recovery from the morphine habit; says it is useless in cardiac dyspnoea, and that it has no anodyne properties.

My own observations of the action of sulphonal were carried out under the same conditions, and in about 50 of the same patients as in the case of paraldehyde. The number of patients to whom the drug was given was 166. Of these 69 were males and 97 females. The dose was administered at 7 o'clock P. M., in some hot menstium (milk, beef-tea, etc.), as advised by Kast. The results obtained were as follows:

In 27 cases of epileptic dementia with marked insomnia, 143 trials were made, the dose being gr. xxx in all the trials. Of these, 123, or 86 per cent., produced from six to nine hours' sleep; 9.1 per cent. from three to five hours; and 4.9 per cent. were negative.

In the more restless and noisy states of chronic mania 269 trials upon 21 cases gave 206, or 76.5 per cent. of successes; 13.8 per cent. partially so; and 9.6 per cent. were negative. Dose from gr. xxx to gr. xlv.

In acute mania larger doses were necessary—average dose gr. xl; 108 trials upon 4 male and 6 female patients gave 75 per cent. successful; 10.1 per cent. of doubtful efficiency; and 14.9 per cent. negative.

In the maniacal phases of periodic mania and circular insanity 70 per cent. of 47 trials upon 5 cases were successful: 11 per cent. were nega-

tive; and 19 per cent. of doubtful value. The same doses were used as in acute mania.

In 43 cases of chronic dementia (including all varieties except epileptic) 199 trials gave 70.3 per cent. successful; 18.2 per cent. fairly so; and 11.5 per cent. negative. Average dose gr. xxv.

In 33 cases of chronic melancholia without very marked mental depression, all sleeping habitually from one to four hours, 330 trials were made, an equal number upon each patient. Of these, 67 per cent. were successful; 17.2 per cent. of doubtful value; and 15.8 per cent. were negative. Seven of these cases could not be influenced by the drug, although as high as gr. 50 were given.

In acute melancholia sulphonal was used in 21 cases—8 male and 13 female patients, all of whom were in the first three months of the disease, and the majority of them were instances of extreme mental depression, amounting in many to absolute agony. In these cases 178 trials of the drug were made, with the result that only 49 per cent. were successful, while 36 per cent. were wholly negative, and 15 per cent. were doubtful results.

In 6 cases of general paralysis of the insane, presenting the same stages as those in which paraldehyde was employed, 39 trials were made. Dose, gr. xxx. Of these, 30.8 per cent. only were successful, 46.2 per cent. partially so, and 23 per cent. failed.

Summarizing these results, as in the case of paraldehyde, we find that the whole number of trials of sulphonal upon these 166 patients amounted to 1313: of these, 910, or 69.3 per cent., produced from six to nine hours' sleep; 206, or 15.6 per cent., from three to five hours' sleep; and 197, or 15.1 per cent., were negative in effect.

From the above it would appear that sulphonal is most successful in the insomnia of epileptic dementia, and least so in acute melancholia; that it is about equally efficient in the insomnia of all the remaining dementias and periodic mania (in the latter states its success exceeds that of paraldehyde by 21 per cent.); also, that it is far more useful in maniacal conditions than in depressed states, and upon this I wish to lay especial emphasis, as I consider that sulphonal does harm instead of good in any form of melancholia. The reason of its failure to produce sleep in such conditions may be partly due to its slowness of action, but the mental condition of the patient must be considered as the first factor. It is the after-effects of the drug, however, that make it very undesirable in such cases, and tend to deepen the mental depression of the patient.

The power of sulphonal as a hypnotic in acute and chronic diseases, in which pain, cough, dyspnoea, or fever were the underlying causes of the wakefulness, was tested in 20 cases, other than those already referred to. They consisted of 6 cases of erysipelas, 4 of acute rheumatism, 2 of phthisis, 2 of acute abscess, 2 of suppurative tonsillitis, 1 each of lead

colic and cardiac dyspnœa, and 1 each of neuritis of upper extremity and asthma. In these, 190 trials were made, 42 per cent. being successful, 48 per cent. being negative, and 10 per cent. giving uncertain results.

In the 2 cases of opium habit in which I have employed the drug, one case was very much relieved by it, and the patient expressed himself as much pleased with its effects, while in the other case it was useless, although large doses were given. From 120 observations upon 40 patients, the average time in which they slept after taking sulphonal was found to be sixty-three minutes.

Having considered the actual proportion of the successes and failures of these two drugs, I will now compare their after-effects.

Although, as we have seen, these two drugs differ considerably in their action in the various mental diseases, as well as in other diseases, their greatest differences lie in their after-effects. Here they widely diverge, one being capable of producing very few and comparatively innocuous after-effects, while those produced by its fellow are, to say the least, capable of being dangerous to life. A paraldehyde habit has been noted in a few cases since the advent of the drug, but I have not yet seen a case, although many of the patients in this institution have been taking it for many months continuously. Among this class of patients I have in vain sought for a case; and from the very limited number of cases that have been reported, when we consider its very general use since 1882, I conclude that it must be a rare occurrence compared to the frequency of the chloral, chloroform, or morphine habit. It certainly possesses two great safeguards in its taste and the odor it leaves upon the breath for from eight to sixteen hours after its ingestion. Whether sulphonal is liable to form a habit I am at present not able to say; but I have one patient who has been taking it about six weeks, and who has recently repeatedly asked to have the dose increased. Neither have I seen the continuous use of paraldehyde followed by serious nasal ulceration, as Dr. J. G. Kiernan has reported (*Wood's Therapeutics*), although in several cases I have seen a scattered papular eruption over the upper part of the body in debilitated subjects.

The principal after-effects of paraldehyde in my cases have been due to its irritant action upon the gastro-intestinal mucous membrane, and for this reason it should be given well diluted. Diarrhœa, vomiting, and impairment of the digestive functions have occurred in about 7 per cent. of cases. Strange as it may appear, I have seen its continuous use followed by increase in appetite and a corresponding increase in digestive power in several cases of atonic dyspepsia. Whether this was wholly due to its stimulant action upon the gastric mucous membrane, or was the result of the relief of sleeplessness, it is difficult to say, but I think that probably both combined gave the result. I have never seen paraldehyde produce any serious alteration in the pulse, temperature, or

respiration, and these observations are abundantly confirmed by many who have extensively used the drug. It will be sufficient to quote from a paper by H. C. Harris, M. D., on its use upon 152 patients at the Norristown, Pa., Insane Asylum. He says: "Its advantage over chloral, in our experience, is mainly that there is no danger from its action on the heart; in fact, 100 minims have been given to cases of acute mania without the slightest noticeable effect upon the heart or respiration." The very fact that this drug has been so extensively used since 1882, and that so few bad effects have been noted, proves pretty conclusively its safety, even in the fullest therapeutic dose.

What evidence have we that sulphonal is capable of producing more serious symptoms? The very high commendation which it received at first led to an extensive use of the drug, and very soon cases were reported in which unpleasant symptoms occurred. Dr. Bornemann (*Deutsche medizinische Zeitung*, Nov. 26, 1888) relates a case—male, aged fifty-three, suffering from the morphine habit—who was given 90 grains in four hours. Muscular weakness and incoördination and great mental depression were produced, while the ataxia did not disappear until the sixth day. Dr. Schotte, of Cassel, has reported a case in which difficult movement of the tongue, stupor, headache, and loss of appetite persisted for four days, and were succeeded by an eruption, like that of measles, over the entire body, lasting two days. Dr. Engelman (*Wiener medizinische Blätter*, Nov. 1, 1888) gives a case—female, aged forty, suffering from chronic metritis—in whom only gr. xxx produced, the following morning, a diffuse scarlet eruption, extending symmetrically over the body, which subsided with violent itching on the third day.

It may be stated that 30, or 18 per cent., of my 166 cases experienced unpleasant after-effects. Some persons seem very susceptible to it (as in Case III. detailed below), while I have given in violent maniacal states as much as one drachm daily for twelve days, with no alarming symptoms. The after-effects of sulphonal are far more variable and are more significant of its more powerful action upon the great nerve centres than those of paraldehyde. The effects which it in some cases produces bear no direct proportion to the amount ingested, so that the production of the various symptoms in these cases must, at least in great part, depend upon other conditions of the organism itself; while I have no doubt that the conditions of its solution in and absorption from the intestinal tract have great influence also in their production. The after-effects which I have seen follow its use will be best understood from the following detailed cases:

CASE I.—Female; aged forty; periodic mania. In the intermissions patient was in good health. During an attack of active mania one drachm daily in divided doses was given for two days. On the morning of the third day she was much depressed mentally, pulse small and

feeble, respiration distinctly slow, and temperature 96.4° F. Upon attempting to walk, great muscular weakness was evident. This condition lasted for two days, after which her mania re-appeared. Sulphonal was resumed in the same dose, and the same symptoms returned on the fourth day, with very marked muscular incoördination added. These symptoms abated gradually in three days after the withdrawal of the drug.

CASE II.—Male; aged twenty-six; acute mania. Was given gr. xv three times a day. Beginning on the second day, this patient had successively headache, vertigo, slight and, later, decided weakness of the heart-beat, pallor of the surface, coated tongue, dryness of the mouth and pharynx, and repeated emesis, all passing away when the drug was stopped.

CASE III.—Female; aged thirty; epilepsy. After one dose of gr. xxx of sulphonal slept well, but, when seen sitting in a chair the following morning, could not be roused. The pupil was half dilated, and reacted to light very slowly; the eyelids drooped, and the head inclined forward upon the chest; sensation to the prick of a pin was abolished; the muscle reflexes could not be obtained, and respiration was slow and somewhat irregular. These symptoms persisted for forty-eight hours, and then gradually passed away. There was in this case total disability to walk, even with the assistance of two persons.

CASE IV.—Male; aged thirty-three. The continued use of gr. xxx of sulphonal at night followed by lassitude, distaste for food, weakness, occasional vomiting, and diarrhoea.

CASE V.—Male; aged forty-five; chronic melancholia. Gr. xlv of sulphonal daily for three days produced extreme weakness, dryness of the mucous membranes, and a peculiar semi-delirious condition, in which the patient seemed conscious at times that he was acting strangely.

CASE VI.—Female; aged sixty-five; chronic melancholia of a mild form. This patient is sensible in conversation and only looks upon the dark side of life; insomnia very marked. Sulphonal, gr. xxx, at night for ten days was given, when symptoms resembling closely those of acute alcoholism came on. She conversed volubly, incoherently, and without her accustomed sense, while a decided stagger in her gait was manifest. This latter symptom seemed due partly to lack of coördination, while muscular power seemed also affected.

CASE VII.—Female; aged thirty-two; periodic mania. In the intermissions is afflicted with persistent insomnia. Sulphonal, gr. xxx, at night was given with good effect, but on the fifteenth day an eruption appeared. This consisted of deep red blotches, slightly elevated, well defined, varying in size from a pin's head to a split pea, and uniformly distributed over the body. Intense itching accompanied it. This eruption faded in three days, the drug being stopped, but when sulphonal was resumed, a week later it came back and presented the same appearances.

CASE VIII.—Female; aged thirty-eight; acute melancholia, associated with phthisis and exophthalmic goitre and intense insomnia. Was given sulphonal, gr. xxx, at night, and after the third dose left foot became swollen and red, with considerable œdema of subcutaneous tissues. In a few hours similar patches of erythema, with less œdema, appeared on both thighs, arms, and anterior surface of the trunk. In the latter situation it assumed a papular form upon an erythematous

base. These patches were the size of the hand, and rapidly appeared and disappeared in the various regions named. This condition passed away gradually in four days after the drug was stopped. During this time the woman had a slight degree of fever, lassitude, and loss of appetite.

CASE IX.—Male; aged fifty; chronic mania. After having had gr. xxxv of sulphonal for a week at night, began to show lassitude, congested eyes, dry tongue, weak pulse, diarrhoea, anorexia, and muscular weakness and incoördination. When the latter symptoms appeared sulphonal was discontinued, and they gradually passed away in three days.

CASE X.—Female; aged twenty-eight; epilepsy. After gr. xxx of sulphonal one day, followed by gr. xxx the next day, appeared dull and weak, and twelve hours later had great difficulty in swallowing even liquids. These symptoms passed away in twenty-four hours.

The last case that I will refer to is of especial interest as illustrating the severity the after-effects of this drug may attain.

CASE XI.—This patient was a vigorous, healthy female, of fine physique, but subject to epileptic seizures. Her attacks have been rapidly increasing in frequency, and gr. xx of sulphonal three times daily were added to her treatment. After taking six doses, dizziness and drowsiness appeared, which, by the following day, had deepened into stupor, with unsteadiness of gait and an indescribably dull appearance of her usually attractive face. The patient was in a dreamy state with drooping eyelids, an anxious expression, and seemed in constant fear of some impending danger. She frequently exclaimed, "I hardly know where I am." At this time there was also dryness of the buccal mucous membrane, decided dimness of vision, and rapidity and weakness of the pulse. Sulphonal was now stopped, but, nine hours later, she fell upon the floor from weakness, and one hour later her condition was as follows: She was unconscious but could be roused with difficulty, respiration shallow, laborious, and 40 to the minute; mouth very dry, but she swallowed without difficulty. The tendon reflexes were nearly absent, while the pupils, which were equal and somewhat dilated, reacted to light very slowly indeed. Sensation in the skin and conjunctivæ was abolished. The bodily temperature was 97° F. After six hours patient uttered a few inarticulate words and relapsed into profound unconsciousness, which lasted for fifteen hours more, when she again became partially conscious, and for the next twenty-four hours she kept alternating between coma and consciousness. During the comatose periods the respirations were more rapid, and at one time were 42 to the minute, while the pulse was weaker than when she became partially conscious. On the third day she could be roused by the voice, but recognized no one. Now her respiration was 25 to the minute and the heart was acting much better. In the afternoon of the fourth day pulse and respiration were about normal. There was extreme mental confusion and a mild delirium at times. By the seventh day the woman was nearly in her usual good health again. At no time was there any fever.

These cases certainly proved that sulphonal is capable of being a dangerous remedy, even when used in therapeutic doses. Many of our patients, however, received larger doses and yet suffered no bad effects.

In one case of chronic mania gr. lxxv daily were given for over a week without bad effect, and it did not produce sleep. The remainder of the cases in whom marked after-effects were noted suffered in milder degrees sulphonal intoxication, as detailed in the above eleven cases. The most common of the effects observed were lassitude, dizziness, and vertigo, diarrhœa, vomiting, and great mental depression, with a dreamy half-unconscious expression upon the face. In two cases partial loss of muscular coördinating power was the only effect produced, and these patients did not sleep from its use. The very various symptoms produced by sulphonal suggest a very general action upon the nervous system, but it remains for the experimental therapist to explain their causation. Cervello says: "Paraldehyde affects the cerebrum, spinal cord, and the bulbous successively, abolishing the reflexes, causing anæsthesia by anæmiating the brain and cord. It is eliminated by the lungs, and is not a cardiac poison." In some of my cases in which sulphonal was employed weakness of the circulation was very marked, while in Case X. respiration appeared chiefly affected. Why the drug in one instance produces delirium, in a second incoördination of the muscular system, in a third difficult movement of the tongue, and in a fourth stupor, cannot be explained from our present knowledge of its action.

The practical deductions that my experience with these two drugs would suggest are:

I. That paraldehyde is the safer hypnotic where a continuous action is desired.

II. That paraldehyde has a wider range of application in mental disease than sulphonal, and that in the insomnia of acute or chronic disease, where pain, cough, dyspnœa, or fever exist, sulphonal is less effectual than paraldehyde.

III. That in all depressed mental states sulphonal acts ineffectively, and acute melancholia should be a contra-indication to its use, while in maniacal conditions it is more satisfactory than paraldehyde. That the use of the former in general paralysis of the insane should be carefully considered, while in acute melancholia the latter is usually effective.

IV. That a high degree of physical debility with insomnia should contra-indicate sulphonal.

V. That in 18 per cent. of cases various degrees of sulphonal intoxication appear, and that it would seem that the drug is capable of being dangerous to life, and that, therefore, the commencing doses should be small, some persons being extremely sensitive to its influence.

VI. That the effects produced by sulphonal are not always in proportion to the dose administered, and that in some cases at least it very seriously interferes with the normal bodily secretions, while paraldehyde does so to a very much less extent.

In conclusion, my thanks are due to Dr. Eliot Gorton and Dr. L. L. Mial for aid in collecting the results referred to, and for references to cases in their wards.

A CASE OF TUBERCULAR ULCERATION OF THE BLADDER, WITH UNUSUAL CLINICAL HISTORY.

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TUBERCULOSIS of the bladder is a condition of so comparative infrequency clinically, that I have thought the following history worthy of record. The case itself presents some other features of unusual interest :

The patient, P. P., aged eighteen years, first came under my care on December 18, 1883. At that date there was a history of hæmoptysis some one and three-quarters years before. The hæmoptysis had not recurred till two days before I saw him—*i. e.*, December 16, 1883, when he brought up a considerable quantity of blood. The patient described it as “coming up in mouthfuls.” Beyond this, the previous history, as reported, was satisfactory. The family history was fairly good. There was no evidence of phthisical taint.

Examination showed the patient to be about five feet eight inches, slightly built, and of spare habit. The complexion fair, bright, and clear. There were no manifest signs of disease. Patient was thin, but there was no marked loss of flesh. There had been no night sweats. Previous to the later hæmoptysis there had been but little cough. There was slight dyspnœa. The chest showed flattening below the right clavicle, and over the same area and a corresponding area posteriorly the note was relatively duller than on the opposite side. Auscultation anteriorly from the apex to the level of the third right interspace, and posteriorly to the middle of the scapula of the same side, revealed the presence of bronchial breathing, largely masked by medium crepitations, with increase of vocal resonance. The left side was practically normal, with the exception of general feebleness of the respiratory sounds and slight prolongation of expiration. Expectoration was not copious. The sputum (examined by the Ehrlich-Weigert method, some weeks later) was found to contain the tubercle bacillus.

The patient's appetite was feeble. The urine showed a faint trace of albumin—but, in respect of this last observation, it should be noted that the patient, as afterward appeared, had been, for some years up till that date, a persistent masturbator. The urine was not altered in respect of quantity or specific gravity. Such was the condition in December, 1883.

With regard to the treatment and progress of the case, it is unnecessary for the present to say more than that, during the succeeding months, the patient made steady progress. By the end of spring he had gained in weight; the expectoration, which had never been very copious, gradually disappeared. Hæmoptysis did not recur (with the exception that

on one or two occasions the sputum was streaked with blood), the crepitations became less marked, and the cough ceased.

At the commencement of the winter of 1884 the patient was examined with care and the following points noted. There was an increase of more than sixty-one pounds of weight. The whole right chest, but more particularly the apex, was much retracted, the sternal end of the right clavicle projecting anteriorly, so that it could be felt as a rounded prominence through the clothes. The apical dulness remained. Breath sounds over the dull area were hardly audible. Morbid accompaniments of the breath sounds were absent. On the left side the condition was little altered; the lung appeared healthy, with slight accentuation of the respiratory sounds. There was practically no expectoration and the cough had quite gone.

Throughout the winter this progress was maintained, and in the spring of 1885 his condition was so satisfactory that I allowed him to resume office work. The patient did not see his way to go abroad. *For about two and a half years from this date* he continued hard at work in an accountant's office, with few interruptions on account of passing colds or slight gastric disturbance. He seemed perfectly restored, with the retracted lung as the only remembrance of his former illness.

Last winter, that is to say, the third winter since he resumed business, he became less careful of himself, more especially in respect of evening work and engagements. Occasionally he was laid up with slight colds, but these he threw off easily, and the chest, examined from time to time with care, remained undisturbed.

He was apparently in good health till June, 1888, when he came to see me on account of having passed what he thought to be a little clotted blood after making water. Apart from this there was no symptom. Unfortunately, he had not kept the clot. His water was examined and found to contain no albumin, no blood, no sugar. There was no polyuria or frequency of micturition, nor was there any pain during the act or on pressure over the pubes.

At my request, he came to see me again in a week's time, with various samples of urine, and in one of these a small piece of shreddy, almost pulaceous, substance was found, and a few blood cells. At this date, while he did not complain of further lung symptoms, a few distinct crepitations could be heard by auscultation over the second and third interspaces of the right side. After that he passed repeatedly—but often at intervals of some days—similar masses. From the first I examined these for the tubercle bacillus. They appeared to consist largely of round cells and structureless material. The tubercle bacillus was not at first discoverable. After many attempts one mass was obtained which examination showed to be crowded with the bacillus, so that no possible doubt remained as to the diagnosis.

Some weeks later, the patient caught a severe chill after a late evening engagement, which appeared to aggravate the lung condition. Cough returned and abundant crepitations speedily appeared at the right—*i. e.*, the already retracted side. At the end of six or eight weeks the previously healthy lung became affected. Slight impairment of the percussion note was traceable, and a few crepitations were heard in the second and third interspaces anteriorly. The patient rapidly lost flesh. The temperature, which, during the whole course of his illness, apart from the early hæmoptysis, had been seldom elevated, now fluctuated between

99° F. and 102° F. Within six weeks or two months, all the ground was lost which hitherto had been gained.

When the shreds were first discovered, I examined per rectum, and was able to trace slight tenderness on pressure toward the neck of the bladder, and some fulness to the left of the middle line, in the region of the left seminal vesicle. Mr. Caird, who kindly saw the case along with me, some weeks later, confirmed the latter observation. There was no apparent disturbance of the testicle or prostate. There was no distinct evidence of kidney affection. I concluded, therefore, that the source of the membranes, which were discharged intermittently, and some of which, of irregular shape, were about the size of a ripe pea, must be the bladder, the other parts of the genito-urinary tract being not necessarily affected. The analogy of other cases afforded presumptive evidence that the kidneys possibly shared the disease.

The patient gradually sank, and died on the 4th of December, 1888.

Post-mortem examination. The right lung was found to be small and bound by extremely firm adhesions to the costal wall. The lung was of firm consistence and tough to the knife. The cut section revealed a dense fibrous structure, with some scattered tubercle. The lower part was less fibrous, and the tubercles were more abundantly evident. There was one vomica, about the size of a small bean. The left lung was slightly adherent toward the apex. There was no pleural effusion. The lung was firmer than normal, and in parts emphysematous. On cut section it was found congested and partially studded with what appeared to be recent tubercle located more particularly in a band of about one and a half inches broad, running midway across the upper lobe.

There was no fluid in the abdominal cavity. The right kidney, of peculiar S- shape, seemed normal, also the right ureter. The left kidney was enlarged, and evidently tubercular (but this was not cut into). The left ureter was thickened and considerably dilated. The bladder showed a small erosion at the entrance of the left ureter, and a large ulcer, about an inch in diameter, one-quarter of an inch deep at its edge, situated on the anterior aspect of the bladder, near where the wall of the viscus becomes continuous with its neck. In the centre of the ulcer the bladder wall had almost given way, while the edges were irregularly excavated, with shreddy fragments loosely attached. Apart from this, the bladder wall was uniformly smooth, not inflamed. The prostate and urethra appeared normal. Both seminal vesicles were thickened, and the vas deferens of each side, as also the duct, was thickened and hard. The testicles seemed healthy.

The case appears to me one of peculiar interest, in respect more especially of the following points:

(1) It illustrates the extremely protracted course of some cases of tuberculosis pulmonum (the patient was five years under close observation) and the treachery of apparent cures.

(2) The most hopeful line of spontaneous cure is that of fibrous formation and gradual shrinking of the affected lung.

(8) There may be a comparative absence of symptoms at the onset of tubercular affection of the genito-urinary system.

(4) In relation to the gravity of the bladder lesion, the persistent

absence of cystitis, or even discomfort in micturition is very remarkable. The passage of so large membranes without the patient's knowledge is noteworthy. The patient was never conscious of their being passed till they were seen in the chamber-pot.

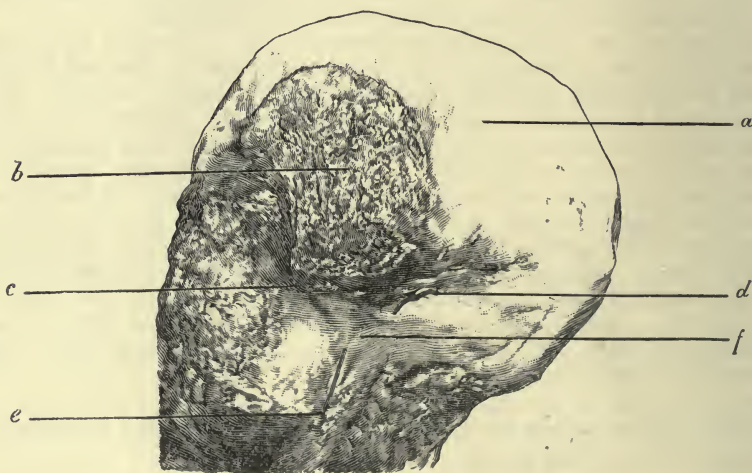
(5) The probability of the source of the membranes in the bladder was presumed from their size and irregular form. (This was confirmed by *post-mortem* examination.)

(6) The diagnosis of their tubercular nature was rendered absolute by the Ehrlich-Weigert method of staining and microscopical examination.

(7) Some difficulty was experienced in connection with the staining process. Many membranes were examined before bacilli were detected, while the individual bacilli, when stained, took on the stain less readily and less fully than tubercle bacilli obtained from other sources. Possibly the action of the urine was responsible for this.

(8) A possible relationship might be suggested—though I am not inclined to lay a great deal of stress on this—between the previously long-continued masturbation and the determination of the tubercular process to the presumably weakened system.

The accompanying drawing of the bladder (after a photograph kindly



a. Anterior wall of bladder. *b.* Ulcer. *c.* Urethral opening. *d.* Right ureter, opening or orifice. *e.* Left ureter, orifice. *f.* Trigone of bladder.

taken for me by Mr. Paterson) will convey a fairly accurate impression of the appearance of the ulcer *post-mortem*.

REVIEWS.

INTESTINAL SURGERY. By N. SENN, M.D., Ph.D., Professor of Principles of Surgery and Surgical Pathology, Rush Medical College, Chicago, etc. 8vo., pp. vii., 269. Chicago: W. T. Keener, 1889.

In this volume the author has collected the following of his papers: 1. The Surgical Treatment of Intestinal Obstruction. Read before the Congress of American Physicians and Surgeons, Washington, 1888. 2. An Experimental Contribution to Intestinal Surgery, with Special Reference to the Treatment of Intestinal Obstruction. 3. Rectal Insufflation of Hydrogen Gas, an Infallible Test in the Diagnosis of Visceral Injury of the Gastro-intestinal Canal in Penetrating Wounds of the Abdomen. Read before the American Medical Association, 1888. To this last article are appended the reports of three cases in which the use of rectal insufflation in wounds of the stomach and intestines is illustrated. A *résumé* of the last two papers has already appeared in this journal.

The surgical treatment of intestinal obstruction is treated in elaborate and systematic detail. After an earnest plea for early operative interference, the author enters into the schematic consideration of his subject. For practical purposes all cases of obstruction are considered either as acute or chronic. The importance of this pathological condition is shown by the fact that out of every three to five hundred deaths from all causes in hospital practice, one is due to intestinal obstruction.

The surgical resources in the treatment of obstruction are classified as follows:

1. Irrigation of the stomach. This treatment, introduced by Kussmaul, diminishes intra-abdominal tension, relieves the distention of the bowel above the seat of obstruction, and, by evacuating accumulated contents, diminishes vomiting and violent peristalsis. Again, if employed prior to the administration of an anæsthetic, the danger of eructated fluid entering the trachea during ether vomiting is avoided. Senn always washes out the stomach with large quantities of warm water rendered antiseptic by salicylate or hypophosphite of soda, thereby preventing putrefactive changes in the intestinal contents above the seat of obstruction.

2. Distention of the colon with fluids. Since experiments and practical application have proven that insufflation of gas is as efficient, as readily applied, safer, and more penetrating than injection of fluids, the latter treatment should no longer be employed.

3. Rectal insufflation by hydrogen gas. This gas has been found non-toxic, non-irritant, easily absorbed. Distention of the entire gastro-intestinal canal with this gas by rectal insufflation, both in man and animals, is never followed by immediate or remote ill effects. The re-

sisting capacity of the ileocæcal valve is overcome by a pressure of one and one-quarter to two and one-half pounds. Slow and continuous insufflation is safest and most effective. Full anæsthesia also renders the valves more permeable. A quarter of a pound pressure, if slow and continuous in application, is sufficient to force gas entirely through the gastro-intestinal canal.

In the diagnosis of the seat of intestinal obstruction, either before or after laparotomy, in cases of suspected perforation, hydrogen insufflation will be found of great service, while in case of invagination it may be not merely diagnostic, but positively curative. It should never be employed by means of the Davidson syringe, since the amount of pressure may by this method become dangerous. Again, it must be remembered that, even with great care, rupture of the bowel may take place, especially in cases of acute invagination or even in chronic cases after the first few days. This is particularly the case in very young children.

4. Tubage of the colon. This is indicated for detection and location of obstruction below the sigmoid flexure, for relief of gaseous distention of the colon, for the administration of nutrient enemata. It is exceedingly doubtful whether the tube can ever be passed beyond the sigmoid flexure.

5. Manual exploration by the rectum. This is only to be undertaken by surgeons with small, slender hands, and upon patients fully under the effect of ether.

6. Taxis and massage are only applicable to cases of obstruction due to foreign body or fecal accumulation, before inflammatory changes have taken place.

7. Puncture of the intestine. This may be performed when no mechanical obstruction is present, and when the rapid distention of the abdomen constitutes in itself a source of grave danger. A small sharp aspirator needle should be used, with the idea of evacuating only gaseous contents. In an enormously distended, consequently parietic bowel, the danger of extravasation after puncture is great. If possible, the needle should be thrust through the intestinal wall in a direction oblique to the long axis of the gut. The gas should be encouraged to escape by uniform pressure upon the abdominal wall.

8. Uniform and uninterrupted compression of the abdomen. This is one of the most efficient means of preventing rapid distention, and should always be applied before this complication arises. It is accomplished by padding the iliac regions with absorbent cotton and enveloping the body from the pubes to the sternum in overlapping strips of adhesive plaster.

9. Enterotomy. This should not be performed unless the patient's condition absolutely forbids a more radical operation. When indicated the incision should be made in the right iliac region. The peritoneum should be stitched to the skin, and the first presenting loop of intestine should be secured in the wound.

10. Colotomy. This should always be performed in the right or left groin. After suturing the peritoneum to the skin, a loop of the colon is drawn out and the parietal wound is closed by sutures passing through the mesocolon of the prolapsed gut, which is thereby fastened into the abdominal incision; finally, each limb of this prolapsed loop is stitched to the parietal peritoneum throughout its entire circumference.

11. Abdominal section. The object of this procedure is to remove

the cause of obstruction, and to render the canal patulous throughout. Statistics show the immense importance of early operative interference. Asepsis must be more rigidly enforced, though the use of stronger antiseptics in the abdominal cavity is to be avoided. The patient should lie during the operation on a rubber bed filled with hot water. The stomach should always be irrigated before anæsthesia, after which chloroform is first administered, then ether is given, and is pushed to its full surgical extent throughout the entire operation. The incision should be so free that both the eye and the hand may be used in searching for the seat of obstruction, and in the absence of tumor or other guiding symptom this opening should be made in the median line. Where, with an incision sufficiently large to admit the hand, the seat of obstruction cannot be determined within ten or twenty minutes, the surgeon must resort to exenteration, the bowels being caught and wrapped in warm aseptic compresses. In case the obstruction cannot yet be found, or, if found, as a means of judging whether yet other obstructions exist, insufflation of hydrogen gas may prove of great service. If, finally, the surgeon is still unsuccessful in finding the seat of trouble, the empty bowel below the obstruction should be inflated by hydrogen, and between its highest point and the lowest ascertainable point of the bowel above the obstruction an intestinal anastomosis should be established. This method of restoring the continuity of the intestinal canal is in all cases preferable to circular enterorrhaphy, since it is safer and more rapid in execution. In case intestinal anastomosis physiologically excludes a portion of the gut, this portion either resumes its normal function as the cause of obstruction disappears, or becomes atrophic. Should it become necessary to incise the bowel for removal of a foreign body, the incision should not be made at the seat of impaction, but through healthy tissue at some distance from this point. Gangrene or tumors may indicate an enterectomy. The continuity of the bowel should be restored by lateral approximation, unless only a portion of its lumen has been involved, when the gap may be closed by suturing together the serous surfaces on either side. Intestinal obstruction due to ligamentous bands should be treated by tracing the band to its point of fixation and dividing it between two ligatures. Care should be taken before making this division to see that the band is not made up of a diverticulum too large to be safely trusted to a ligature. If the obstruction is caused by flexion, adhesions must be separated, and in case of gangrene or perforation a V-shaped piece of gut must be resected. Obstruction from visceral adhesion of coils of intestine should be treated by lateral approximation and physiological exclusion, or, if there is any sign of gangrene, by excision. Defects in the parietal peritoneum, made in separating old adhesions, must be repaired by suturing, or by peritoneal or omental grafts. Most minute attention must be paid to the toilette of the peritoneum. If flushing of the abdominal cavity is required, it should be dried by sponges wrung out in 1 to 5000 sublimate solution, and in such cases drainage should always be employed. Button sutures, passed down to the peritoneum, are indicated where there is great tension. Finally, after the antiseptic dressing is applied, the abdomen should be uniformly supported by means of straps and bandages, and, the cause of the obstruction having been removed, purgatives may prove most beneficial in restoring peristalsis.

Of the anatomico-pathological causes of intestinal obstruction, the biliary calculus is first considered. The seat of lodgement is most frequently in the lower portion of the ileum or the upper part of the jejunum. The concretion should be broken up by direct manual pressure, or by means of a needle passed obliquely through the bowel; this failing, the gut must be incised and the obstructing body removed. In all cases the calculus must be pushed away from the seat of impaction before any operative treatment directed toward its removal is attempted. In cases of incision and removal, after suturing the incision as usual it should be still further reinforced by an omental graft. The enterolith is subject to the same treatment.

Fecal obstruction is mostly met with in the region of the cæcum or the sigmoid flexure. Sooner or later it causes a catarrhal enteritis which may terminate in perforation. If the bowel is paralyzed and inflamed, purgatives are most deleterious. The appropriate treatment consists in massage and high injections. In case symptoms persist, the abdomen should be opened and the mass within the gut should be broken up and pushed down, or, if the condition of the bowel requires it, enterotomy should be performed.

Invagination is a frequent cause of intestinal obstruction. Thirty per cent. of all cases, excluding hernia and congenital malformations, are due to invagination. It is most common in the young, and is placed usually in the ileocæcal region. All cases of invagination should, as far as operative treatment is concerned, be classified into acute and chronic. The former attack most frequently the young, and demand prompt interference. The latter occur more commonly between the twentieth and fortieth year, and inflammatory changes come on more slowly. Pathologically speaking, acute intussusception is characterized by obstruction of the bowel and strangulation of the intussusceptum. The constriction of the latter at the neck of the intussusciens is shortly followed by œdema, stasis, and gangrene, occurring so rapidly that adhesions between the serous surfaces have not time to form. Perforation at the neck of the intussusciens is usually the cause of death in acute cases. In the treatment of intussusception the lower bowel should be thoroughly emptied by enemata, and, after the patient has been profoundly anesthetized, should be gently and uniformly inflated by hydrogen gas. A sudden diminution in pressure would mean either disinvagination or rupture. In the latter case the general tympany and disappearance of liver dulness would indicate the nature of the case. Colotomy may be necessary in acute cases when the patient's strength will not admit of laparotomy, and in irreducible chronic cases involving the colon and rectum. Enterotomy may also be performed when the patient is *in extremis*. The right iliac region is usually selected, and the operation may frequently be done without the use of anesthetics.

In general, laparotomy should be performed at once if gaseous enemata fail to reduce the bowel. The incision should be made in the middle line, and if the gut is not gangrenous, an effort should be made to produce disinvagination. Since the main difficulty in accomplishing this usually lies in the swelled and œdematous intussusceptum, the latter should be subject to steady and continuous manual compression before efforts at reduction are made. If compression followed by traction fails, the lower bowel should be inflated by hydrogen gas. Reduction still not being accomplished, adhesions must be broken up by a probe

passed between the intussusciens and intussusceptum. Reinvagination is not greatly to be feared, but can be absolutely guarded against by making folds in the mesentery parallel to the bowel, these folds being retained by a few sutures. If reduction is absolutely impossible, an anastomosis should be made between the bowel above and below the invagination. Resection is indicated only when gangrene has occurred. The continuity of the bowel may be perfectly restored by lateral implantation or lateral approximation with decalcified bone plates.

Volvulus is a comparatively rare cause of intestinal obstruction. As it can only occur when the mesentery is of some length, its common seats are the lower part of the ileum and the sigmoid flexure of the colon. Death results more rapidly from this form of obstruction than any other. In the very beginning rectal insufflation may be successful. If not, laparotomy should be performed immediately. The bowel should be untwisted and the mesentery should be shortened by being folded upon itself and sutured. In case of gangrene resection is necessary. If reduction is impossible without evacuation, an incision is made in the summit of the loop, the contents are removed, the wound is sutured, and renewed attempts are made at reduction. These failing, and the patient's condition not justifying a resection, a communication between the bowel above and below the volvulus may be secured by lateral approximation.

Obstruction by flexion is most frequently met with in the pelvis near the internal inguinal ring or in the ileocecal region. If the continuity of the canal cannot be restored by freeing the adhesions, an anastomosis should be established between the two bars of the flexion.

Obstruction due to adhesion is a not rare sequel to laparotomy; the prognosis is exceedingly bad. With a view to preventing this complication, laparotomists should carefully avoid irritating the peritoneum by antiseptic solutions or rough sponging, and every effort should be made to restore any break in the peritoneal surface. These cases must receive early operative interference.

In strangulation by ligamentous bands or diverticula, search should be made in the pelvis and the ileocecal region. Failing to discover the cause there the umbilical region should be explored. This form of obstruction is most amenable to early treatment. The band should always be traced to the point of attachment and divided between two ligatures. If the strangulation is due to a diverticulum the latter should be secured at its base with a rubber ligature and resected. The end should then be invaginated and maintained in this position by sutures.

Obstruction due to congenital or cicatricial constriction should be treated by an intestinal anastomosis established around the coarctation.

In obstruction due to tumors the cause of the obstruction must be removed, together with as much of the gut as is necessary, the continuity of the canal being restored by intestinal anastomosis or lateral implantation. If so much of the gut is removed that this is not practicable, the distal end is permanently closed and the proximal end is stitched in the wound. If the cause of obstruction cannot be removed, either an intestinal anastomosis can be made or the ileum can be divided just above the ileocecal valve, the distal end closed, and the proximal end implanted in the bowel just below the seat of obstruction. If a median incision has located the tumor in the colon, cæcum, or rectum,

and a radical operation is determined upon, a lateral incision will probably be required.

Finally, there is a dynamic form of obstruction, due to cessation of peristalsis, caused either by inflammation of the muscular coat or paralysis of the sympathetic nerves. The contents of the parietic bowel are prone to undergo putrefactive changes, producing extensive tympanites. Sudden death may be caused by rapid distention. The gas cannot be expelled on account of numerous flexions, and because there is pressure of some portions of the intestines by the distended loops. The liver will be pushed up, but not away from the diaphragm, unless there is gas in the peritoneal cavity. When life is threatened by the distention, repeated aspirations are indicated. Peritonitis may cause this dynamic intestinal obstruction, either from fixation of the gut by plastic exudate, or from an effect upon the sympathetic system. The differential diagnosis between acute intestinal obstruction and peritonitis is at times exceedingly difficult.

Catarrhal and ulcerative enteritis may also produce all the symptoms of acute intestinal obstruction, and finally, after exenteration, it is by no means rare for obstructive symptoms to manifest themselves. The administration of a brisk cathartic two or three days after the operation, together with uniform compression of the abdomen, are advised as methods of avoiding distention.

In a work characterized not only by careful arrangement and clear exposition, but also by a patience of research and an originality of conception which promise the author a lasting fame in the annals of surgery, there must necessarily be much to praise; and again, it is a poor book in which there is nothing to criticise.

The most striking, the most valuable of Senn's original conceptions or applications are:

1. The uses of gaseous enemata both for diagnostic and therapeutic purposes.
2. Lateral approximation by decalcified bone plates.
3. The application of omental grafts in abdominal surgery; and,
4. The mechanical irritation of peritoneal surfaces between which it is desired that adhesion should take place.

The value of all of these methods has been experimentally proven, and they have been successfully applied by Senn and by other surgeons who have carefully reviewed his work. It is difficult to determine whether the enthusiasm and the confidence with which he writes should be praised or condemned. After completing his book, the surgeon lays it down with the conviction that at last the difficulties and dangers of abdominal work have been overcome, that the definite rules of operative procedure are established, that this branch of surgical knowledge is completed from Alpha to Omega. In the toil and travail of an obscure case there may be a tendency in the mind of the operator to resent this "cock-sure" style which filled his mind with such joyous anticipation, but when one or another of Senn's brilliant expedients has finally brought him to a successful termination, he may be disposed to look more forgivingly on this fault.

The greatest value of Senn's work is its suggestiveness. He has set surgeons in all countries to thinking and planning. His methods as such may none of them be permanent, but he has given an impetus to abdominal surgery the outcome of which none can foresee, but which is

full of promise. He is in the very van of progress, a leader who is not infallible, but who has earned by hard work and ability the enviable place he holds in the scientific world.

The gaseous enemata which he advocates as an infallible test in the diagnosis of wounds of the gastro-intestinal canal, will probably not be found to sustain this claim, yet no one can deny the immense value of this method, nor withhold admiration for the genius which prompted its application. Finally, his book should be read to be duly appreciated, and no higher tribute can be paid to its value than that it stimulates the surgeon to better thought and better work.

THE OPERATIONS OF SURGERY: A SYSTEMATIC HAND-BOOK FOR PRACTITIONERS, STUDENTS, AND HOSPITAL SURGEONS. By W. H. A. JACOBSON, F.R.C.S., Assistant-surgeon Guy's Hospital, etc. 8vo., pp. 1006. Philadelphia: P. Blakiston, Son & Company, 1889.

MR. JACOBSON has, it seems to us, been unnecessarily modest in calling his work on operative surgery a "hand-book." It well deserves the title of a treatise, as it is one of the most comprehensive with which we are familiar, and at the same time one of the most satisfactory.

It is a peculiarly difficult period at which to write a book of this character. So many operations which may fairly be called new, and which have been evoked by the stimulus of antiseptics, are now on trial before the profession; so many others under the same influence are constantly undergoing change and modification; so many regions hitherto left untouched by the practical surgeon, or, at least, only remotely and uncertainly approached by means of drugs, caustics, irritants, etc., are now fearlessly opened up and explored, that the operative surgery of to-day is altogether different from that of the time of Sir William Ferguson, or, indeed, from that which many of us were taught a few years ago. In addition, nearly all the statistics of even the longer-established major operations are undergoing constant revision, so that the choice of the particular operative procedure in any given case is by no means an easy one. It follows that a book of this kind, which some years ago would have been sufficiently full if it had merely detailed the various steps of the received operations, must now, to be satisfactory, carefully record the varying and often contradictory opinions of the day, and balance one against the other, as upon the result of such a process will depend not only the operation selected, but often the decision as to whether or not to interfere at all. In these respects Mr. Jacobson's book is exceptionally satisfactory.

While full as regards operative detail, it gives on the whole a very complete digest of the state of contemporary opinion as to the many and important matters still unsettled in the minds of surgeons. How numerous these are, a glance through the book at once indicates, as it does also the excellent method pursued by the author of giving *in extenso* the views of the chief advocates or opponents of special methods. An example or two may be taken almost at random. Of excision of the larynx, he says: "The value of these operations is still *sub judice*; much,

therefore, of the following will require confirmation." This is followed by fifteen pages, in which Newman, Morris, Butlin, Mackenzie, Cohen, Lennox Browne, Hahn, Semon, Gerster, Gussenbauer, and others are fully and freely quoted, giving a very comprehensive view of the prevailing surgical opinions. Of litholapaxy in male children he says: "The advisability of this mode of treating stone is still *sub judice*." He then gives the views and experiences of Surgeon-Major Keegan, to which, however, he himself fails to subscribe. This plan is followed throughout the work, and, it seems to us, gives it a special and peculiar value. While certain subjects are omitted and others but imperfectly treated, and while its scope is decidedly more limited than that of Stephen Smith's, for example, it nevertheless admirably supplements that valuable manual of operative surgery. Excellent examples of the thoroughness of treatment which, as a rule, characterizes the book, may be found in the articles on removal of the tongue, on operations on the head and neck, and on operations on the bladder.

Mr. Jacobson's evidently large personal experience has been fully drawn upon, and adds much to the interest and value of the book, which is by no means a mere compilation, although received authorities and current medical literature are so extensively cited. For example, before quoting Mr. Greig Smith as to removal of the uterine appendages, he expresses the opinion, which is that of most general surgeons, that "it is above all one of those operations which should never be entertained if there are any honest doubts as to the patient's health being really impaired beyond the aid of other treatment, and the impossibility of otherwise restoring her to usefulness in the position in life in which she has been placed."

His remarks on excision and erosion of the knee, based on an experience of fifty-seven cases of the former operation; on preliminary tracheotomy in excision of the tongue, which he has performed twenty-three times, etc., will serve to indicate the value of this personal element in the book. On the other hand, when he lacks familiarity with an operation he does not hesitate to say so. Of excision of the pylorus, for example, he says: "To my mind the very high mortality and the rapidity of recurrence render it extremely doubtful whether this operation should ever be performed, even in the most exceptional cases. But I ought to state that this is the outcome of an examination of published cases, and not from any personal experience of the operation."

Among the deficiencies of the book we may note the absence of any satisfactory description of the radical cure of femoral hernia, the mere allusion to operations upon the vertebral column, the absence of specific directions for operations upon the different bursæ, the failure to mention the use of hydrogen in the diagnosis of intestinal wounds, the lack of specific directions for many of the minor but frequently needed tenotomies, the paucity of the surgical and regional anatomy of some of the more important ligations, etc. It is only fair to say that, owing to a very unsatisfactory index, and to the topographical classification of operations adopted by the writer, some of the above may have been overlooked. On the whole, however, Mr. Jacobson is to be congratulated in having made a distinct success in a very difficult field of surgical literature, and in having produced a book which cannot fail to be valuable to every practical surgeon, and which in subsequent editions can easily be made one of the best in this or in any language. J. W. W.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY. Vol. XIII., for the year 1888. 8vo., pp. 502. Philadelphia: William J. Dornan, 1888.

THE annual meeting, whose record of proceedings is here given, was held in Washington, D. C., on September 18, 19, and 20, 1888, thirty-nine of the sixty-five Fellows being present, of whom thirty took an active part in the meetings, at which nineteen papers were presented. The volume for the year is not so large as some have been, because of the absence of any very long papers, but is the more valuable on this account, and does great credit to the zeal and industry of the Fellows. We can only direct attention to a few of the articles in the volume.

"Palpation of the Ureters in the Female," by Howard A. Kelly, M.D. This is a subject which has been attracting considerable attention for a few years past, and especially since the method of catheterizing these conduits has been simplified by Prof. Pawlik, of Prague, and made of practical value in determining the nature of kidney diseases, and whether one or both organs is affected in a given case. Prof. Kelly has made an extensive study of the ureters in many women abroad and at home.

"Cases of Ovariectomy Twice Performed on the Same Patient," by Sir T. Spencer Wells. This paper presents a table of thirty-two operations performed in the cases of sixteen women, with two deaths, the intervals varying from eight months to twenty-four years, all of the first as well as the second ovariectomies having been performed by him, except in the cases of two of the women, upon whom he only made the second section. One hundred and seventeen women, from whom Sir Spencer Wells removed but one ovary, bore collectively 228 children. The 14 second operations occurred in about 700 recovered women, from whom one ovary had been removed during the childbearing period.

Dr. William T. Lusk writes on "The New Cæsarean Section, with Reports of Three Successful Cases," performed respectively on March 22, 1887, October 31, 1887, and November 21, 1887. In the discussion, two additional successes were reported by Prof. Howard A. Kelly, of Philadelphia, the operations dating April 17, 1888, and May 30, 1888. Prof. Lusk has had a fourth operation since, on December 13, 1888, which, being performed under desperate conditions, resulted fatally. There have been 26 of these operations, with 16 deaths, in the United States. Exclude our own country (26) and Great Britain with India (3), and we have left 136 operations with 26 deaths, for Continental Europe; the mortality (45), in 165 cases, is $27\frac{3}{11}$ per cent.; that of Continental Europe alone, as far as known, $19\frac{2}{17}$ per cent.

"On the Severe Vomiting of Pregnancy," by Dr. Graily Hewitt, is much the longest paper in the volume, and treats of the presumed causes and the treatment of this sometimes fatal complication of pregnancy. It is one of the most thorough and critical examinations of the subject, with all of its multiple exciting causes, that has ever been written, and will repay a perusal.

"The Dangers of Galvano-puncture in Pelvic Tumors," by Ely Van de Warker, M.D. This paper is a very honest statement of the risks under Apostoli's method by one who fully understands the electrical treatment, has had a large experience with it, and believes that it has a great future

when discriminately and properly used; but that it will not answer for many tumors seemingly fibroid, which, in fact, are of a cystic character; as the current has a tendency to develop the cyst cavities and greatly enlarge the growth, as well as to change the character of the contained fluid, rendering it purulent, and thus endangering life. The paper, with the discussion upon it, is valuable as a dispassioned and unprejudiced examination of the present status of Apostoli's method, which is certainly growing into favor with many American and British gynecologists, whose prejudices have not been such as to prevent them from giving it a fair and extensive trial.

Dr. H. Marion Sims writes on "Sterility, and the Value of the Microscope in its Diagnosis and Treatment." The sensible treatment of female barrenness should be addressed to the cause of disability, which being properly removed and the husband determined to be competent, impregnation naturally follows. Repeated trials with the syringe, especially in France, except in the cases of hypospadiacs, have shown that imperfect intromission is rarely the real obstacle to conception. Dr. Sims, like Dr. H. P. C. Wilson, of Baltimore, still advocates the late Marion Sims's plan of posterior incision of the cervix, which he claims is devoid of risk if a stem pessary is at once inserted and the woman kept in bed. In the discussion, Dr. Cornelius Kollock, of South Carolina, related the case of a lady who bore twenty-two children at single births, the last being delivered when she was sixty-two years and eight months old. Prof. Barker was of the opinion that there were no well-authenticated cases older than fifty-five. We are under the impression that this is an error, and that births in women of sixty or over have been in several instances recorded. We know one case where a widowed grandmother of fifty-three years became impregnated by a man of twenty-four.

The paper on "The Influence of Pregnancy on Pelvic Diseases," by Dr. James B. Hunter, combats an old idea that pregnancy "is a possible remedy for many of the diseases from which women, especially young women, suffer," and holds the opinion that pregnancy has in all but a few exceptional conditions quite a contrary effect. Among the diseases enumerated are those of the anus and vulva. Malignant diseases of the vagina and cervix are aggravated; so also are inflammations of the glands of Bartholini; hemorrhoids; cysts of the vagina; prolapse of the bladder, and erosions of the cervix. Fibroid tumors, as a rule, are stimulated to grow; but there are exceptions, especially where they are subperitoneal and distinctly sessile. Ovarian tumors also grow during gestation, and are in danger of bursting from pressure.

Dr. Horace Tracy Hanks writes "On the Early Diagnosis of Ectopic Pregnancy, and the Best Method of Treatment," and gives reports of two cases which were successfully treated by electricity, in which he enters minutely into the details of proof that ectopic gestation existed. This is an excellent paper upon the differential diagnosis of extra-uterine as distinguished from intra-uterine pregnancy. The author believes that a diagnosis can be made in the early months, and that the electrical is the proper treatment in a large proportion of cases.

The volume of Transactions for 1888 is generally regarded as one of unusual value and interest, the papers being brief, well digested, and bearing the evidences of much thought and care in their preparation; we regret that we cannot give a more general and extended notice of them.

R. P. H.

DIE STERBLICHKEITSVERHÄLTNISSE IN DEN KRANKENPFLEGEORDEN.

Von DR. GEORG CORNET, prakt. Arzt in Berlin u. Reichenhall.

ON THE MORTALITY AMONG TRAINED NURSES. By DR. GEORGE CORNET.

Zeitschrift für Hygiene, vi. 1889, 65-96.

NOTWITHSTANDING the general belief in the infectious nature of tuberculosis, but little is done to prevent the dissemination of the poison. With a view to emphasizing the danger incurred by those brought into contact with consumptives, unless proper precautions are taken, Cornet has collected some statistics of the mortality among certain classes of nurses in Prussia, and has tabulated them in a way which brings out the results most strikingly. In Prussia, 41 per cent. of all the trained nurses are members of some one of the numerous Catholic religious orders. Of these the vast majority (5470 in 1885) are nuns, who enter the convents when quite young and are pledged to service for life. Because of their life-service and of the accessibility of records running back many years, Cornet selects this class as the one least liable to furnish erroneous statistics.

The tables are based upon returns from thirty-eight orders, which, for the past twenty-five years, have had an average annual membership of 4028. During that period there were 2099 deaths. Of these 63 per cent. were the result of tuberculosis. In nine of the convents the mortality from tuberculosis was 70 per cent. or more, and in two every death for twenty-five years had been the outcome of the same disease. This is the more surprising when it is remembered that the average mortality from tuberculosis among all classes of the community is only about 15 per cent., and that many of the nurses were employed in surgical wards, where, as has been shown by Cornet in a former paper, the danger of infection with tuberculosis is but slight.

A second table shows the average age at which death occurs among these nurses to be 36 years, younger than it occurs among classes engaged in the most dangerous occupations. More than 84 per cent. of the deaths took place between the ages of 20 and 50. This largely increased mortality during these years depended upon the large number of deaths from tuberculosis. Two-fifths of all the deaths were due to tuberculosis occurring between the ages of 25 and 40 alone.

In the endeavor to determine the time at which tuberculosis developed Cornet has arranged the cases in another table according to the duration of their membership in the various orders. From this we see that nearly twice as many died during the first ten years of service as during all the rest of the time, and the table shows this to depend upon a greatly increased mortality from infectious diseases, and especially from tuberculosis, during that time. Nearly all these cases of tuberculosis are thought to develop after entrance into the convent, for a careful medical examination must be submitted to by the candidate before admission.

Perhaps the most startling presentation of the cases is in Table VII., which is intended to compare the longevity of nurses with that of the rest of the community. It is shown, for example, that the average individual who reaches the age of twenty one years has still thirty-eight years to live, whereas the nurse, under the same circumstances, has only

sixteen years before her; in other words her life is shorter than the average by twenty-two years.

Cornet considers the inordinate mortality among nurses as the result of tuberculosis, disclosed by these statistics, to be dependent upon the neglect of precautions against the spread of the disease. There is certainly nothing in the ascetic life of the nun which could predispose to tuberculosis. Her infection must then in some way be due to her contact with phthisical patients. But Cornet has shown that the ordinary mode of dissemination of tubercle bacilli is in air which has become contaminated with particles of dried sputum, and he believes this to have been the mode of transmission in the cases under consideration. His recommendations for prophylaxis are limited to careful attention to the removal of all sputa before there is opportunity for drying and infection of the air.

J. S. E.

RECHERCHES CLINIQUES ET THÉRAPEUTIQUES SUR L'EPILEPSIE, L'HYSTÉRIE ET L'IDIOTIE. Par BOURNEVILLE, SOLLIER, PILLIET, RAOULT et BRICON. Pp. lix., 260. Paris: Bureaux de Progrès Médical, 1888.

CLINICAL AND THERAPEUTICAL OBSERVATIONS UPON EPILEPSY, HYS-
TERIA, AND IDIOCY. By BOURNEVILLE and others.

THIS volume contains a number of interesting chapters upon epilepsy, hysteria, and idiocy, founded upon observations made at the Bicêtre asylum during the year 1887. In a former volume the authors have treated of the same subjects, drawing their material from the adult section of the asylum. In this volume the infant section is reviewed, statistics of cases are given, a description of the processes of education of the weak-minded is presented, and a study of some interesting forms of nervous disease is offered.

The greater part of the clinical section of the volume is taken up by a study of "procursive epilepsy" by Bourneville and Bricon, a large number of cases of this rare disease being collected. Procursive epilepsy is that form of epilepsy in which the attacks are characterized by rapid running or propulsion, either directly forward or in a circle, instead of by convulsions. These attacks never exceed in duration that of an ordinary epileptic attack, are not accompanied by a fall, are not followed by coma, but are accompanied by a very marked congestion of the face. A similar act may occur as a motor aura of a regular attack, or as a post-epileptic phenomenon. Such attacks usually occur in the daytime. If the patients have attacks at night they take the form of rapid, violent turning in bed, with a laugh or succession of odd noises. A number of instructive cases are given, and the authors attempt to show that this form of epilepsy is usually found in persons with maldeveloped brains and weak minds.

A number of autopsies are recorded in which anomalies were found in the cerebral convolutions, and in two cases lesions were situated in the cerebellum. As the location and character of the lesions differed much in similar cases no definite pathology is discovered. Treatment appears to have been unavailing, and the majority of the cases developed ordinary epilepsy or became either vicious or weakminded.

The chapters which follow are devoted to the study of two cases of double athetosis in imbeciles; the temperature during an epileptic attack (a rise of about half a degree centigrade is found to be the rule); anomalies of the genital organs in idiots; malformations of the extremities and of the teeth; and some interesting examples of insanity of childhood.

Such a collection of observations is to be commended, for it brings before the profession the results of hospital experience, and forms a valuable contribution to clinical medicine.

M. A. S.

THE APPLIED ANATOMY OF THE NERVOUS SYSTEM. By AMBROSE L.

RANNEY, A.M., M.D., Professor of the Anatomy and Physiology of the Nervous System in the New York Post-Graduate Medical School and Hospital, etc. Second edition; rewritten, enlarged, and profusely illustrated. 8vo., pp. xxxv., 791. New York: D. Appleton & Company, 1888.

DR. RANNEY'S *Anatomy of the Nervous System* is very well known, and the second edition is a decided improvement upon the first. The section on the brain, as of necessity in these days of constant investigation and rapid progress, has been almost entirely rewritten, and the portion on the cranial nerves and the cord enlarged. Perhaps the most striking feature of the book is its numerous illustrations (238 in number), many of them of high artistic excellence, especially those which are copied from Sappey and Hirschfeld. In addition to this, the original diagrams aid the student very materially in mapping out the course of the various sets of fibres both in the brain and in the spinal cord.

We must, however, take exception, both in Figs. 43 and 91, to the distribution of the fibres of the optic nerve to the retina. In both of Dr. Ranney's diagrams the distribution of the fibres is from the entrance of the optic nerve to the right and to the left, the non-decussating fibres of the right tract supplying the right retina from the porus opticus to the right border, that is to say, more than one-half of the retina, and the decussating fibres of the right tract similarly supplying the left retina from the porus opticus to its right border, that is to say, less than one-half. The distribution really is from the middle line, and the text, which speaks of the fibres supplying this or that "half" of the retina, is correct. Only by this correct distribution from the middle line, and not from the entrance of the optic nerve, can the phenomena of hemianopsia be explained. It is difficult to express this distribution by a cut we know, but it should at least be explained by a foot-note that the error results from mechanical reasons.

W. W. K.

CLINICAL LECTURES ON DISEASES OF THE URINARY ORGANS. By SIR

HENRY THOMPSON, Surgeon Extraordinary to His Majesty the King of the Belgians, etc. Eighth edition. 8vo., pp. xiv., 470. London: J. & A. Churchill, 1888.

No man has made a deeper and clearer mark upon the history of urinary surgery than the author of these lectures. His skill, his oppor-

tunities, and his excellent literary work, have made him among the first, if not the very first, of living authorities on the subject of which he treats.

As originally published twenty years ago, these lectures were twelve in number; they have grown to thirty-two, six having been added since the last edition. The additions will be found in connection with the suprapubic opening of the bladder, its digital exploration, the latest methods of treatment in advanced prostatic disease, and for intracystic tumors, with an epitome of the author's cases of calculus, reaching nine hundred in number up to the end of 1886.

The high or supra-pubic operation for the removal of stones or tumors from the bladder is historically reviewed and most strongly endorsed, having been performed twenty-three times by the lecturer within the last few years. Indeed, between lithotrity on the one hand and the high operation on the other, it would seem as if the occasions when a resort to the classical lateral method will be justifiable will be very few. Indeed, it is quite probable that the existing generation of surgeons may see pass into desuetude an operation so long the pride of bold and skilful practitioners.

Having indicated the thoroughness with which Sir Henry Thompson has kept his lectures up to the times, it would be useless to bestow praise upon the force, clearness, and accuracy which belong to them. Those qualities are well known to pertain to the lecturer, and call for no praise of ours when the wide popularity which adheres to his book is remembered. It is enough to say that these lectures continue to hold the high place which belongs to their predecessors, and may be still looked upon as models of clinical lectures having no superiors and few equals.

S. A.

REPORTS FROM THE LABORATORY OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH. Edited by J. BATTY TUKE, M.D., and G. SIMS WOODHEAD, M.D. Vol. I. 8vo., pp. 212. Edinburgh and London: Young J. Pentland, 1889.

As stated in the preface, this volume represents a portion of the work done in the Laboratory of the Royal College of Physicians of Edinburgh for the first year of its existence.

The first paper is one by Woodhead, on the "Equipment of the Laboratory," and is of interest to all those who are engaged in the arranging of such rooms. Copious illustrations aid very largely in making the subject clear.

The second essay is one by Berry Hart and J. T. Carter, on "Sectional Anatomy of Advanced Extra-uterine Gestation," and is very ably written; the cuts being unusually clear and well executed for such a subject. The authors have examined frozen sections of two specimens, one a four and a half months' extra-uterine pregnancy *in situ* in the bony pelvis; the other, an entire cadaver with advanced abdominal gestation.

The third paper is by Woodhead, on the "Use of Mercuric Salts in Solution, as Antiseptic Surgical Lotions." The conclusion reached is

that the biniodide is a far more safe and reliable antiseptic than is bichloride.

We have not space to enumerate the other papers here found. To the neurologist, that of Dr. Bruce, on a "Case of Congenital Absence of the Corpus Callosum," is of great interest.

Altogether the volume is of very considerable value, and is a credit to the College from which it emanates and to the authors whose contributions make up the contents.

H. A. H.

THE TREATMENT OF LATERAL CURVATURE OF THE SPINE, WITH APPENDIX ON THE TREATMENT OF FLATFOOT. By BERNARD ROTH, F.R.C.S. 8vo., pp. 56. London: H. K. Lewis, 1889.

THIS monograph is mainly based on the author's article, "Lateral Curvature of the Spine," contributed to Heath's *Dictionary of Practical Surgery*, 1886, and some papers published in *The British Medical Journal* and the *Clinical Society Transactions*. Its appearance is timely, and its object is to prove the utter uselessness of spinal supports of any kind, and the advantages of the author's plan of gymnastic treatment. He says wisely: "I have not ventured to put down 'cured' in any case, although 'very much improved' is almost synonymous, because I have maintained that any case of lateral curvature of the spine, with even a trace of osseous deformity, due to rotation of the lumbar, dorsal, or cervical vertebræ, is to that extent incurable; while, on the other hand, some surgeons deny that lateral curvature is present unless there is some permanent rotation of the vertebræ visible externally."

The author's confidence in his mode of treatment may be inferred from the sentence which immediately follows: "Only three cases out of two hundred are noted as 'not improved,' which was due to deficient energy on the part of the patients, and neglect to carry out my directions."

His system consists of graduated systematic exercises, intended to strengthen the spinal muscles, and bring about a correct position. There are in all twelve exercises for correcting the deformity, four of which are to be carried out by the surgeon, and ten subsequent exercises are given as a "home prescription," "to keep up the improvement and to prevent any relapse." The system, doubtless, is good, and the "simple exercises for developing the thorax, including systematic deep breathing," are most excellent, but we believe that the same results are obtained in similar cases by fewer and simpler exercises, and the use of a light steel corset, not as a corrector, but simply as a *reminder* to the patient when not exercising.

In the appendix the author has added an article on "The Treatment of Flatfoot." In speaking of its frequent association with lateral curvature, his statement, "That out of every three cases of lateral curvature of the spine, two suffer from flatfoot, and one severely so," does not coincide with the experience of surgeons here. Speaking also in support of the theory he has adopted of its production, after Thomas, of Liverpool, it is painful to hear him criticise the "normally constructed foot," which

writers on surgical anatomy generally have admired, adding: "If we had to create a new foot and leg, simply with the view of preventing flatfoot, we should plant the lower end of the tibia rather more toward the outer margin of the foot." Further, we cannot see how the clumsy "wedge-shaped sole" can accomplish restoration as well as the neat inside plantar spring with an internal border, as introduced to the profession by Dr. Roberts.

The photographs in the first part are excellent, and the work on the whole readable, illustrating how much can be accomplished by systematic exercises in the treatment of the milder forms of lateral curvature of the spine.

THE PHYSICIAN AS NATURALIST: ADDRESSES AND MEMOIRS BEARING ON THE HISTORY AND PROGRESS OF MEDICINE CHIEFLY DURING THE LAST HUNDRED YEARS. By W. T. GAIRDNER, M.D., LL.D., Professor of Medicine in the University of Glasgow; President of the British Medical Association; Physician in Ordinary to H. M. the Queen in Scotland. 8vo., pp. x., 436. Glasgow: James Maclehose & Sons, 1889.

"THE memoirs contained in the present volume," the preface informs us, "form a portion . . . of a much larger number of scattered contributions to the literature—scientific and practical—of medicine during more than thirty years past." Not one of them but may be read with pleasure, interest, and information. The preëminent duty of the physician to be an observer first and a theorist last; to be at least aware, even if he is debarred from active participation therein, of the researches in all departments of natural science that are progressing around him; is the keynote which reëchoes throughout all these admirable essays. But, notwithstanding the necessity to keep abreast with modern science, we must not wholly cut loose from the traditions and learning of the past. Its errors and delusions can serve as warnings to avoid similar misleadings in the present; but medicine being progressive, has an historic continuity, and there is also much of positive and enduring value which we should lose were the study of the ancients and of the elders to be neglected.

Two topics clearly and forcibly treated by Dr. Gairdner may be specially referred to: A series of papers upon "The Limits of Alcoholic Stimulation in Acute Diseases," the original publication of which, during the years 1858-64, did much to overturn the still prevailing theory and practice of Todd, and to emphasize the value of milk as a nutriment in febrile states generally; and an essay upon "Homœopathy," which might be studied with advantage by many unthinking "liberalists" of the present moment. This latter is eminently calm and judicial, and for that reason the more crushing in its logical exposure of the incongruities and fallacies, the perverted observation and gratuitous assumptions upon which the so-called "law of similars" is sought to be established.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

PHENACETIN.

In Professor v. Ziemssen's clinic, DR. HIRSCHFELDER has employed phenacetin in a variety of diseases. The dose varied from five to fifteen grains three or four times a day, and the powder was readily taken by the patients. Cyanosis and dyspnoea did not accompany its use; now and then a slight chill or headache with dizziness was noticed; in three or four cases there were digestive disturbances which recurred on repetition of the dose, but soon did not reappear. An exanthematous eruption followed its administration in certain patients. These accompaniments of its use were chiefly in the weak and anæmic.

When used as an antipyretic there was more or less copious perspiration thirty to fifty minutes after its administration; the temperature was lowered in one or two hours and reached its minimum in four hours; the rise was rather more gradual than the fall, the return to the maximum requiring about six hours. With the fall in temperature the pulse was also diminished. Upon normal temperature the action of phenacetin was slight, but it caused some diaphoresis.

In a case of phthisis where sweating was restrained by atropine the reduction of the temperature was not marked.

The administration of phenacetin in phthisis, or in chronic forms of fever, was not always as successful as in acute fevers; at times even large doses had no marked effect upon the temperature. In one case of phthisis there was a subnormal temperature of 95° F., but without collapse.

An hypnotic action of phenacetin seemed to follow in a few cases. Its influence upon rheumatic processes is probably chiefly as an antipyretic. In affections of the nervous system, such as neuralgia, hemicrania, cardialgia, neuritis, etc., it gives relief promptly, and its use may be continued for a long

time without giving rise to any unpleasant symptoms.—*Deutsches Archiv f. klinische Medicin*, vol. 44, 1889.

In this connection the confirmatory results of an Alabama physician, DR. THOMAS W. AYERS, are of interest. He reports nothing but the best results from the use of phenacetin. The temperature he found began to fall in about thirty minutes, and the minimum was reached in about three hours. The duration of the reduction is usually from four to six hours; but, of course, much depends upon the dose given and upon the disease. Ten grains will usually be found sufficient to lower the high temperature by three degrees, after the lapse of from two to four hours. The transition of the high temperature to the lower, and *vice versa*, is a gradual one. After large doses, say fifteen to twenty grains, have been administered, profuse perspiration occurs, but no bad consequences supervene. No eruption like that produced by antipyrin and other antipyretics was seen.

As an antineuralgic it is unquestionably the superior of antipyrin, and is more energetic in its action than either antipyrin or antifebrin. If relief is not obtained in from thirty to sixty minutes a second dose is given, but this is rarely required to relieve any painful affection. The results obtained in the treatment of neuralgias and migraine indicate that all paroxysmal pain is especially susceptible to treatment by this remedy. In occipital neuralgia, hemicrania, facial neuralgia, and dorso-intercostal neuralgia it gave marked relief in all cases within an hour. In several instances an hypnotic effect accompanied its sedative action.

As an antipyretic it should be given in eight to ten grain doses, to be repeated as often as is necessary to control the temperature. Ten grains to adults, repeated every six hours, is a sufficient amount in febrile cases. For the relief of pain in neuralgia, etc., from fifteen to twenty grains are necessary. No evil results followed the use of as much as sixty grains in nine hours.—*Medical Record*, May 18, 1889.

SULPHONAL.

Most observers who have tried sulphonal speak well of it. In most cases it produces, after a period varying in length, a tranquil, natural sleep, from which the patient awakes refreshed. In some patients it fails, and in some forms of insomnia it is absolutely useless. The cases in which it appears to be of most benefit are those in which insomnia is due to purely nervous conditions, whether functional or organic. Thus Kast found it efficient in "neurotics," in the insomnia of old age, and in organic brain disease. Most observers confirm Kast in these statements.

In delirium tremens, in mania, or in any form of delirium it sometimes gives sleep, and sometimes is of no use. Compared with other hypnotics, sulphonal is considered by Rabbas, when given in doses of thirty to forty-five grains, to be much safer and better than amylhydrate and paraldehyde in large doses. Rosin considers that thirty grains of sulphonal are equivalent to one-seventh of a grain of morphine hypodermatically injected, but that for the relief of cough in phthisis the same dose of morphine acts much better than forty-five grains of sulphonal.

Sulphonal does not disturb the digestion, and a careful series of experiments

was performed by Cramer, testing the effects of several hypnotics on the process of digestion. The diastasic action of saliva, for example, was found to be uninfluenced by paraldehyde, amylohydrate, or sulphonal.

In the proportion of one in twenty (a concentration, it may be remarked, rarely possible in the stomach from a medicinal dose) chloralhydrate, paraldehyde, and amylohydrate were each found to diminish peptic digestion; while the results as regards sulphonal were doubtful. The pancreatic digestion of proteids was diminished by chloral and paraldehyde in the strength of one to eighty.

Amylohydrate was less energetic in its action, and sulphonal had no action at all. The results obtained from experiments as to the action of a drug on digestion outside of the body are not of much significance where the substance is soluble, and thus readily absorbed by the stomach and intestines, because, owing to the rapid interchange of fluid in these organs, the drug is rarely present in sufficient quantity, at one time, to affect the chemical process of digestion, but in the case of an insoluble, slowly absorbable drug, like sulphonal, it may produce some effect from a prolonged stay in the interior of the organs. Cramer's negative results as to its action on digestion are therefore important. Kast has shown that a dose of fifteen grains disappears within two hours from the stomach and intestines of a dog, and after six hours only a trace of the substance could be obtained in the blood.

To sum up the advantages which are claimed for sulphonal: In doses of fifteen to forty-five grains it produces a natural sleep, from which the patient awakes refreshed and without any bad after-effects. It is without smell, and has an almost imperceptible bitter taste. Against the drug are its insolubility and its high price.—*British Medical Journal*, April 27, 1889.

UNPLEASANT EFFECTS OF SULPHONAL.

It is of importance that the profession should be informed as early as may be of the drawbacks which attend the use of any new and powerful drug. A valuable contribution to the action of sulphonal has just been made by DR. J. P. CROZER GRIFFITH, who began to employ it as a hypnotic with great interest and expectations. He puts clearly the disadvantages of its use and cites cases, from a large experience, to illustrate the points deserving emphasis.

He considers sulphonal a valuable agent, but not without the power of producing undesired and quite unpleasant secondary effects; and cases now not infrequently reported in the journals confirm this opinion.

It is not at all the object of these remarks to decry a useful medicine, but to aid in establishing its true value in comparison with other hypnotics; and, by pointing out some of its possible disadvantages, to warn against the unpleasant surprises and disappointments which might otherwise lead to its abandonment. First to be noticed among the disadvantages of sulphonal, and undoubtedly a very prominent one, is its *slowness of action in producing sleep*. This is to be carefully borne in mind in determining the hour of its administration; and the patient should perhaps be notified of its peculiarity, or disappointment and dissatisfaction may arise. This slowness of action has so usually been noticed in the cases under his care that to cite instances of it

would only be tedious. As a result of experiments on animals with digestive solutions outside of the body, Kast advises that it be administered in a finely pulverized condition, in at least six or seven ounces of a warm fluid, with the evening meal between seven and eight o'clock. The presence of a large quantity of fluid, of hydrochloric acid, peptones, and of salts, favors the rapid absorption of the medicine.

Another and even greater difficulty to be overcome in the use of sulphonal is the *marked tendency which its hypnotic action has to persist during the succeeding day*. This prolonged hypnotic action has frequently been referred to by writers. L. L. Johnson reports a case in which the patient promptly fell asleep after thirty grains of sulphonal given in the evening, and was very somnolent until the afternoon of the next day. In smaller amounts the drug acted very well. Algeri says that the action of large doses continues through the following day, and Oestreicher has seen sleep remain absent during the night, but persist through the following morning. Lovegrave, too, states that the effects on patients to whom he gave the drug were very discouraging. For several hours after taking it no appreciable action could be noticed, but during a great part of the next day there was extreme drowsiness and considerable cyanosis.

Kast admits that this postponed action is often witnessed, and that it constitutes a great disadvantage when it is necessary that the patient be actively employed during the day. For this difficulty he has no special remedy to propose in addition to the method of administration described, except that the dose be carefully adapted to the individual.

But this *determination of the individual dose* constitutes a sometimes insurmountable obstacle to the use of sulphonal.

The dose probably most often recommended by writers is from fifteen to forty-five grains, and it has been repeatedly claimed that unpleasant effects only follow the administration of a dose unnecessarily large. But this is not a fact.

Rosin found that fifteen grains were seldom, if ever, enough to cause sleep, except in three cases in which starch, given under the name of sulphonal, had an equally good effect. Framajoli and Raimondi believe that an efficient dose for men is sixty grains, and for women thirty grains, and that the best results are not obtained until the third night of administration. Matthes comments on the difficulty in determining the dose of sulphonal, since it not only seems to vary greatly with different persons, but at different times with the same individual. He gave seventy-five grains to one patient without any effect whatever, while in another case which he reports the drug had been used repeatedly with good results; but on one occasion a dose of only seven and a half grains occasioned very unpleasant symptoms.

Unpleasant secondary effects have been already alluded to as constituting one of the disadvantages of sulphonal. Many writers have observed them, so that the claim made by the makers of the drug, and by some of its users, that it is totally without disagreeable secondary action, is not substantiated. Zerner, indeed, estimates that these effects are seen in ten or twelve per cent. of all cases, and Matthes says they were noted in a majority of his patients. Prominent among them may be mentioned a condition of excitement instead of the wished-for sleep. Temporary delusions after the ingestion of the drug

are reported by Fürbringer, and may be classed with the excited mental conditions reported by Dr. Griffith. Nausea, dizziness, and headache have been already mentioned as effects which may follow the ingestion of sulphonal. Matthes says that in some of his cases ringing in the ears, headache, and dizziness were experienced on the next day, and that in two instances vomiting occurred. The production of a marked sense of fatigue, of depression, and of confusion of mind is not infrequently referred to by authors.

A disturbance of gait was seen in two cases. The occurrence of a drunken, staggering gait has also been reported by Zerner and others. Severe motor incoördination and a somnolent condition are liable to appear if sulphonal be given at the same time with opium or to opium habitués.

Engelmann details a case in which forty-five grains produced an erythematous *eruption* over the breasts and inner surface of the arms, attended by considerable itching. Schmey details most unpleasant results following the administration of sulphonal in a case of angina pectoris from arterio-sclerosis. Nitrite of amyl had reduced the attacks to one or two a day, and amylene hydrate produced sleep very satisfactorily. As the patient complained of the taste of the latter, the author administered thirty grains of sulphonal, soon after which the attacks came on with great violence and with only a few seconds intermission during the entire night, without any real sleep. For the next two days the attacks were unusually frequent and severe.

Finally, the *uncertainty of hypnotic action* is one of sulphonal's disadvantages—a fault which it shares more or less with all hypnotics. Cases of failure of action on the part of sulphonal are too numerous in the literature to allow of quoting from them.

The large majority of writers, nevertheless, pronounce favorably for sulphonal. His own experience with it has been, for the most part, satisfactory; for the number of cases in which no unpleasant effects have followed or supplanted the refreshing sleep obtained by its use much exceeds the number from which he has reported examples.

The instances detailed, with those reported from the experience of others, prove, however, that it is to be used with a proper appreciation of the bad results which may follow, that the time of administration is to be carefully determined, and that the doses should be accurately adapted to each individual case.

The chief disadvantages of sulphonal may then be recapitulated as follows: 1. Its hypnotic action usually develops very slowly. 2. This action is very liable to be prolonged throughout a greater or less part of the following day. 3. It is difficult to determine the dose which may be given with effect and with comfort in each individual case, and this dose may vary at different times in the same case. 4. The drug is liable to produce unpleasant secondary effects, which may even replace the primary hypnotic action. Chief among these are mental excitement, nausea, vomiting, dizziness, headache, languor, exhaustion, depression, and a staggering gait. These symptoms may appear either after large or after quite small doses. 5. It very often fails to exert any hypnotic action, either in any dose whatever, or in any amount which can be given with comfort to the patient.

Paraldehyde, and especially amylene hydrate, is preferred to sulphonal,

and disagreeable results following the administration of amylene hydrate are much less frequently reported in the journals than in the case of sulphonal.

The disagreeable taste of amylene hydrate is entirely removed by giving the full dose, forty-five minims, in three capsules of fifteen minims each. It is especially to be preferred where a rapid hypnotic action is desired, or where there is not time to learn by repeated trial the amount of sulphonal suited to the patient in question. In cases, however, in which the stomach is irritable, it is probable that the latter will usually be more easily tolerated. —*Therapeutic Gazette*, May, 1889.

BELLADONNA AND CANNABIS INDICA BY THE RECTUM, IN CERTAIN CASES.

DR. J. W. FARLOW gives the results of several years' experience with these drugs in treating diseases of women.

Belladonna has a sedative action on the uterus and pelvic contents, and relaxes rather than constipates the bowels. Its value in irritable conditions of the bladder and urethra is well known. This combination of qualities is called for in a very large number of women.

Cannabis indica has somewhat similar properties, and especially for sensitive ovaries and in the various painful affections of those organs its use is often productive of much good. It has few equals in its power over nervous headaches, such as women with pelvic trouble are subject to. It has seemed to me that these two drugs were capable of performing excellent service in gynecological practice.

The common complaints of young women are those due to painful menstruation, or where there is perhaps not much real pain, but a considerable degree of pelvic, and even general excitement, making it advisable for them to be very quiet, and possibly to stay in bed, not only during the flow, but also the few days preceding; and often the weakness resulting from this nervous excitement lasts for several days after the flow has entirely ceased. Frequent micturition and headache are also very common. If the excitement can be moderated, if the pelvic organs can be made less irritable, there will be less pain, less hemorrhage, less weakness, and consequently a much longer period of health between the catamenia. This, I feel sure, can often be very successfully done by the rectal use of belladonna and cannabis indica, beginning a few days before the menstrual symptoms or prodromes appear. Marked uterine disease or defects are not referred to in this connection.

As regards dosage and manner of administration, nothing is gained by pushing the drugs to their physiological action, generally a quarter of a grain each of extract of belladonna and extract of cannabis indica in a rectal suppository was used at night, and sometimes it is well to use one also in the morning after the bowels have moved. There are some patients who can tolerate only one-eighth grain of the extract of belladonna, even by the rectum; to such, smaller amounts should be given. —*Boston Medical and Surgical Journal*, May 23, 1889.

USE OF INDIAN HEMP IN CHRONIC CHLORAL AND CHRONIC OPIUM POISONING.

The patient was a strong, healthy man who had taken forty grains of chloral daily for a considerable period. He suffered from terrible depression and insomnia; without chloral no sleep was obtained and even then but little; he took scarcely any food. He placed himself under complete surveillance and restraint; the chloral was peremptorily stopped, and a pill containing half a grain of extract of cannabis Indica with a few grains of compound colocynth pill was taken three times a day.

The result was immediate improvement; the craving for chloral had almost vanished in twenty-four hours; natural sleep returned after a few days, and he began to enjoy his food.

A second case was that of a man who had conquered the habit of excessive spirit-drinking by the frightful assistance of opium. For several months he had taken not less than two ounces of laudanum daily. Cannabis Indica was prescribed, beginning with a quarter of a grain of the extract and increasing gradually to a half, one grain, and one and a half grains, three times a day, with the happiest result. Ability to take food and retain it soon returned, and after a time an appetite appeared; he began to sleep well; his pulse, which could not be counted at first, exhibited some volume; flesh rapidly accumulated, and after three weeks he was able to take a turn upon the verandah with the aid of a stick. After six weeks he returned to his post. The name of the drug was withheld from the patients, as they were treated in India, where it may be obtained with facility in any bazaar.—*Lancet*, March 30, 1889.

ON THE PREPARATION OF SUBCUTANEOUS INJECTIONS OF QUININE.

BENERMANN has been recently experimenting to obtain the formula of a solution of quinine, which, when injected subcutaneously, shall not cause pain, and shall provoke no local reaction.

He obtains a neutral salt by dissolving twenty parts of muriate of quinine in one part of pure hydrochloric acid, and fifteen parts of water. The solution is filtered, and each syringeful contains nine grains of quinine chloride. Benermann has made upward of an hundred hypodermatic injections with the solution without producing pain or any local irritation whatever. He has seen the temperature of typhoid patients fall, and the pain of neuralgia and rheumatism abate under these injections, which, he says, are not followed by the unpleasant symptoms often attending the administration of quinine by the mouth.—*Boston Medical and Surgical Journal*, April 18, 1889.

SULPHATE OF SPARTEIN.

A careful study of the physiological and clinical action of spartein by DR. GLUZINSKI leads him to the following practical suggestions regarding its use.

Of the three stages into which he divides its physiological action he considers that the first stage only is desirable in patients with incomplete compensation.

In a dog he found the early stages of its physiological action to be induced

by about one-fifteenth of a grain, which gave a little less than one grain as a maximum dose for a man. Clinically he found that small doses, as one-third to three-quarters of a grain, of spartein gave more relief than larger doses.

The rapidity with which the heart responds to the action of this drug is characteristic of it, and it is for this reason to be preferred to digitalis, though that drug is far superior to it in every other way.—*Deutsches Archiv für klin. Med.*, vol. xlv., 1889.

THE PRACTICAL VALUES OF CERTAIN ANTISEPTIC AGENTS.

The conclusions of ALEXANDER EDINGTON in regard to some antiseptic agents are suggestive :

In choosing an antiseptic agent it is not sufficient to have tested its germicidal properties only, as the conditions found in wounds are not such as are found in the laboratory, and various reactions may take place in wounds which vitiate the activity of some of the agents employed to procure asepsis.

He considers the use of carbolic acid for washing out wounds a dangerous method of procedure. As a result of the action of a 1 to 20 carbolic lotion upon muscular tissue and blood there is formed a viscous or glue-like mass, so that on the surface of a wound it forms a distinct layer of necrosed material. This, like most dead tissues, forms a suitable nidus for the growth of bacteria. Supposing then that carbolic irrigation be efficient in destroying the microorganisms in a wound, this necrotic area has still to be cast off, and contributes in this way a form of suppuration; during the progress of which excessive care will have to be taken in order to prevent the entrance of fresh bacteria. But as it happens that such a proceeding is hardly likely to be successful, the surgeon using this method simply makes matters worse, in that while he does not destroy sepsis, he ministers directly to it by giving the microorganisms pabulum on which to feed. Thus we see that carbolic irrigation, instead of tending in the direction of the cure of sepsis, predisposes indirectly to pyæmia and septicæmia.

In considering the uses of corrosive sublimate, we have to note that it also causes the formation of a necrotic area if used for irrigation, but in a different way from carbolic acid. In the case of carbolic acid, the fluid left is still carbolic acid, although its strength may be considerably reduced; but in the case of corrosive sublimate the mercuric salt is almost entirely decomposed, and in the tissues we have a distinctly noxious agent left in the form of albuminate of mercury, which being soluble in excess of albumen, is thus liable to be absorbed. This, of course, inhibits the free use of this agent in the case of large wounds. Corrosive sublimate is undoubtedly useful as a preservative of distilled water, and thus fulfils its functions admirably when used by bacteriologists for moistening the filter paper in plate-cultivation apparatus, but its use should be restricted to such and like purposes, for even if ordinary water be used instead of distilled water, the mercuric salt is soon reduced, as Klein has shown.

Under the most favorable conditions, that is, when dissolved in *distilled* water, corrosive sublimate is about twice as powerful as a more recent antiseptic, hydronaphthol, in 1 to 1000 of water. Under the conditions encountered in practice he considers hydronaphthol more powerful than corrosive sublimate; and solutions of 1 to 1000 are not poisonous, and may be freely used.

Hydronaphthol is soluble in 1100 parts of cold water; much more soluble in warm water; it dissolves in twenty parts of oil, and in two parts of alcohol. He recommends a solution in alcohol, or with glycerine added to the alcoholic solution, so as to make it of the strength of 1 in 10. In using a watery solution of 1 in 1000 the water should be kept lukewarm. A solution of 1 in 300 possesses very great germicidal powers, and will be found of the greatest service in washing out septic cavities and wounds.—*British Medical Journal*, May 11, 1889.

CORROSIVE-SUBLIMATE LANOLIN.

Since Koch has shown that solutions of carbolic acid in oil and alcohol have no antiseptic properties they have been prohibited in surgery. In disinfecting the hands and skin it is the fatty secretion which hinders the action of antiseptics.

It is easy to understand how a really antiseptic ointment could be made useful in the treatment of wounds. GOTTSTEIN has devised an ointment which has marked antiseptic properties. He employs anhydrous lanolin as a base, and combines it with a known amount of 1:1000 or 1:5000 corrosive sublimate solution. The mercury salt is not soluble in fats and oils, but in this ointment it acts as if in solution, and its antiseptic properties have been proven by various experiments.

The possibility of mercurialization by long contact with such an ointment is not to be overlooked. Lanolin affords a good medium for the mixture of antiseptics, which are more soluble in water than in oil, as it is not subject to decomposition, and is capable of absorbing a large proportion of water.—*Correspondenz-Blatt*, May, 1889.

SOZOIODOL SALTS.

Soziodol contains about 52 per cent. of iodine, 20 per cent. of carbolic acid, and 7 per cent. of sulphur. Its potassium salt dissolves to the extent of 2 per cent. in water; the sodium salt to 7 or 8 per cent.; the zinc salt dissolves easily; the mercury compound with difficulty. They are odorless.

As an application in diseased conditions of the nares a mixture with some powder, preferably talc, is most serviceable.

The potassium salt may be employed as a substitute for iodoform (it diminishes excessive secretions to a marked degree); the sodium compound for tuberculous ulcerations in the nose, throat, or larynx, as it is more adhesive on account of its greater solubility. Both of these are used with two parts of powder.

The zinc compound, in the proportion of 1 part to 12 or 7 of talc powder, has proved useful in rhinitis hypertrophica, with very slight secretion, and in ozæna.

An acute coryza may be aborted with one or two applications, best made after using a cocaine solution, in order to allow the powder to come thoroughly in contact with the mucous membrane.

The mercury salt is to be used only in diluted form, 1 to 20, or at most 1 to 10, as it is irritating and caustic in its action.

In dermatology and in gynecology, soziodol has found useful applications in the form of powders or ointments containing 5 to 10 per cent. of it.—*Correspondenz-Blatt*, May, 1889.

ANTIFEBRIN AS AN EXTERNAL APPLICATION.

DR. NEWTH tried the effect of antifebrin as a local sedative with remarkable results in a few cases. His usual plan is to prescribe it with lanolin or vaselin in the proportion of five drachms to the ounce, combined with other ingredients that seem applicable to special cases. In obstinate irritable ulcers it soothes the pain and subdues the inflammation. In psoriasis combined with some mercuriul preparation it acts like a charm. In erythema, erysipelas, eczema, herpes, urticaria, and other complaints associated with considerable irritation it was found a most useful adjunct to suitable remedies. —*Lancet*, April 6, 1889.

 MEDICINE.

 UNDER THE CHARGE OF

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 WEIL'S DISEASE.

A. FRAENKEL (*Deut. med. Woch.*, 1889, No. 9), in reviewing the subject of Weil's disease, says that the affection begins suddenly with fever, and often with a chill. The temperature rapidly rises, reaching even 105.8° F., and there is distinct involvement of the nervous system, characterized by sleeplessness, somnolence, or delirium. Next appear icterus, moderate enlargement of the liver, enlargement of the spleen, albuminuria, and diarrhœa. In from six to eight days the temperature falls to normal, and the disease appears to be ended, but in a few days more fever again appears, and gradually rises, to fall again in the same way after three or four days more. The patient exhibits great weakness, especially marked and prolonged in the second attack.

The disease is to be distinguished from acute yellow atrophy of the liver by the favorable course which it runs, the persistence of the hepatic enlargement, and the absence of hemorrhages. There is a form of relapsing fever, known as bilious typhoid, which is not seldom characterized by icterus, cerebral symptoms, and its severe course. It may, however, be distinguished from Weil's disease by the constant presence of the spirillum. That the affection under discussion is a form of typhoid fever with icterus, is not probable, as the marked involvement of the kidneys and the enlargement of the liver are scarcely consistent with the course of this latter disease. Weil believes that it is an infectious disease with swelling of the abdominal organs and their cellular elements; the infection being probably by a virus entering from the intestine.

Fraenkel reports a case whose symptoms correspond with those described. The point of infection, however, appeared to be a wound of the scalp.

The autopsies which have been made revealed enlargement of the abdominal organs, swelling of the solitary follicles and Peyer's patches, small-celled infiltration of the wall of the intestine, and of the interstitial tissue of the abdominal organs, and enlargement of the mesenteric and bronchial glands. The disease, however, usually ends in recovery. The cases hitherto reported may be classified as sporadic or epidemic; those of Fiedler representing the first class, and those of Pfuhl the second.

As regards etiology, Fraenkel believes in the existence of a septic infection, whether from an organic virus or through an intoxication. The carrier of the infection is certainly not always the same, and the point of entrance may be either the intestine or the skin. After a review of the reported cases, he concludes that the complex of symptoms described by Weil does not, etiologically, symptomatologically, or anatomically, exhibit the clinical unity necessary to constitute a distinct disease. And since these symptoms are certainly often the expression of a secondary fever, the result of secondary septic infectious processes, he advises to assume the existence of no new disease, but to designate them by some such title as "infectious or septic icterus."

PROPHYLAXIS OF SCARLET FEVER.

In a recent address before a medical society, BAÜMLER laid down the following rules to be observed in regard to the prophylaxis of scarlet fever:

1. Isolation should begin as early and be carried out as stringently as possible.
2. Isolation must be maintained till all desquamation, even on the palms and soles, is completed.
3. Persons in charge of patients should not mingle with other people, or if this be impossible, every precaution should be taken in the way of disinfecting the hands, clothing, etc., to render the danger of contagion as small as possible.
4. The air in the sick-room should be changed several times a day by opening the windows wide. Care must always be taken not to expose the patient to draughts.
5. All the wash is to be first soaked in a three per cent. solution of carbolic acid, and then boiled with soft soap. The clothes worn just before the beginning of the illness and during convalescence are to be disinfected by passing hot steam through them. Instead of handkerchiefs, rags that can be burned as soon as used are to be employed. Shoes must be wiped, inside and out, with the carbolic solution. The hair should be cut short at the beginning, and the mouth frequently cleansed.
6. For disinfecting painted or papered walls, rubbing with bread that is then to be burned, is the best means. In many cases the paper had best be taken from the walls and new applied. Where walls and ceilings are undecorated they should be freshly calsomined. The wood-work, including the furniture, is to be scrubbed with the carbolic solution. Carpets, mattresses, curtains, etc., must be subjected to the action of steam. The room used by

the patient should remain unoccupied, with windows open, for some time after he has left it.

7. Patients must not be transported in public conveyances, but the community should have at its disposal for such purposes easily disinfected ambulances.

8. The possibility must not be overlooked of contagion being carried by a third person, by toys, by pet animals, by food, etc.—*Fortschritte der Medicin*, March, 1889.

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WHOOPING-COUGH AND PHENACETINE.

HEIMANN (*Munch. med. Wochenschr.*, No. 12, 1889), having failed of success with antipyrine in the treatment of whooping-cough, made trial of phenacetine with excellent results. To a boy of four years he gave four doses of 0.1 gram. each, to a girl of two years three doses of the same size, and to an infant of seven months four doses of 0.05 each. In no case did he observe bad results follow. The effect of 0.1 gram. persisted on the average three hours. To prove that the good results were actually due to the drug, he omitted its administration for a few days, only to find that the frequent attacks returned.

ANTIPYRIN IN WHOOPING-COUGH.

CARL LOWE (*Therap. Monatsh.*, 1889, 169) refers to the almost uniformly favorable action which continues to be ascribed to antipyrin in whooping-cough, and says that in most of his very numerous cases occurring in an epidemic the drug acted well. He reports three cases, however, in which the results were very unpleasant.

The first case, a child of fourteen months of age, developed a condition of extreme excitement immediately after taking the first dose. Through its continued crying new paroxysms were continuously produced, combined with vomiting, so that the parents feared immediate death.

In the second case, a child of about six months, cyanosis and collapse appeared after the second or third dose. On another occasion the author administered a dose of the drug to the patient, and saw this condition promptly develop.

In a third case, a child of two years, the attacks seemed to be made stronger by the medicine, so that in addition to the laryngeal spasm and the vomiting, general convulsions of considerable violence developed.

The author believes that the first and third cases indicate that antipyrin often exerts an intensifying action instead of relieving the disease.

PHENOL IN ENTERIC FEVER.

POPE (*Lancet*, April 13, 1889, 79) induced by the favorable results obtained by Grimshawe with the use of phenol and iodine in enteric fever, resolved to try it. He accordingly treated twenty-two cases of the disease in this way, giving one grain of phenol and one and a half grains of tincture of iodine every four hours. The mixture was well borne, and was not unpleasant to take. The urine had in all cases a greenish tinge, but there was no hæmaturia. In

some cases the morning temperature was a fraction of a degree lower in proportion to that of the evening, than in the case of patients who were not taking the drugs. The author was entirely convinced of its inutility. The fetor of the stools was not lessened, and the course of the disease was not shortened; while the percentages of deaths and relapses were just about the same as in the 120 patients treated without phenol in the same institution during the preceding year.

HYPOCHONDRIASIS IN WOMEN.

E. MENDEL (*Deutsch. med. Wochenschr.*, 1889, No. 11, 205) after calling attention to the various and numerous definitions of hypochondriasis which have been given, would himself define it as a functional disease of the brain, whose chief symptom consists in a fear and anxiety concerning the patient's own bodily condition. It is, therefore, a mental disorder characterized by depression. According to his own observations, hypochondriasis may be divided into three forms.

1. That in which there is simply fear and anxiety as to permanent disease or death; in which the patient has no definite symptoms to complain of, or views entirely un-noteworthy ones (such as a blister on the tongue) as incurable and fatal. This hypochondriasis simplex may be called nosophobia.

2. That form in which, in addition to fear and anxiety, there are sensations in the most different organs, which must be indicated as hallucinations of the sensations of the organs. Such are the feeling as though the abdomen were swollen, the head soft, etc. These sensations are probably produced by an irritation of the cerebral cortex where the various centres for the organs are situated. This second form may be called hypochondriasis with hallucinations of the organ-sense.

3. That, the severest, form in which there are, in addition, disturbances of the higher organs of sense. The patients see and hear things differently than they do when they were well. Everything seems changed to them. They know, however, that the noises and voices which they seem to hear are but diseased perceptions in their own heads.

Any one of the three forms may exist alone, or the first may change into the second, or, more rarely, into the third. The course may be acute or chronic. If the latter, it exhibits the first form during the remissions, and the second or third during the exacerbations.

The existence of hypochondriasis in women has been denied, but the author claims that it occurs very frequently at all ages. The first type as described is very much rarer in women than in men. A woman's association with disease as nurse in her own family, or elsewhere, prevents her from acquiring so easily an excessive fear of it or of death. Syphilophobia, so common in men, is from the nature of the case rarely seen in women. Yet hypochondriasis simplex is sometimes seen in women, and the author describes several instances of it.

The second form is usually common in women, being very possibly as frequent as in men. Very often the hallucinations of the organ-sense are localized in the sexual apparatus, and often coupled with the idea of cancer. Still more frequent is what has been called the cerebral form, in which the patient feels as though the head were empty, or light, or excessively heavy,

etc. From these arises the conviction that an apoplectic stroke is about to occur, or insanity develop. More unusual is the localization of the hallucinations in the spinal system, or in the heart, lungs, etc.

The third form of hypochondriasis has, in the author's experience, occurred more frequently in women than in men. These disturbances of the higher senses, he has no doubt, are due to pathological processes in the sense-centres.

Secondary to the diseased psychic symptoms of fear and anxiety regarding their own bodies, there may develop in the patients various symptoms, such as fear of contact with others, fear to be left alone, entire egoism with consequent inability to attend to business, the determination to commit suicide, etc. This last is much less common in women than in men. On the other hand, the total abandonment of all occupation, and the yielding to the hypochondriacal sensations, is more frequent in women. One of the impulses of hypochondriasis in women is that to onanism, and the author has noticed the habit with remarkable frequency both in married and unmarried females with the disease.

The sleep in hypochondriasis varies. There are often strange motions made, not without purpose, as in hysteria, but with the intent of relieving the hallucinatory sensations. Paræsthesias and hyperæsthesias are frequent, but the anæsthesia and hemianæsthesia of hysteria are not witnessed. Vasomotor disturbances are common. The coexistence of disease of any of the internal organs with hypochondriasis is merely an accidental combination. Hysteria so frequently complicates hypochondriasis that the author names a special form "hysterical hypochondriasis."

As regards etiology, he has had under observation 116 cases of the disease in women, which show that the affection is most apt to occur in the third and fourth decade of life, and that an hereditary tendency to nervous diseases is a powerfully predisposing cause. Strong psychic impressions are common exciting causes.

The onset of the disease is usually slow, the course irregular, accompanied by remissions and exacerbations; the duration, weeks to one or two years; relapses are common. The affection may terminate in recovery, by passing into the chronic form, by changing into some other mental disorder, in death from a complicating disease or from suicide. The prognosis, however, is usually good.

As regards diagnosis, the author says that melancholia, paranoia, and progressive paralysis of the insane likewise exhibit hypochondriacal sensations. In the first, however, the patient blames his own deeds for his condition, and wishes for death; in the second, the patient seeks the cause of his symptoms in the actions of others; in the third, there are seen evidences of organic disease and of mental weakness. The diagnosis is particularly to be made between hypochondriasis and hysteria. Hysteria usually begins during puberty; exhibits often globus, clavus, anæsthesia, localized spasms and paralyzes, etc.; never exhibits fear, anxiety, præcordial anxiety, and hopelessness; presents frequent changes in symptoms, and produces such an expression of face that one cannot believe that the patients feel as sick as they would represent. In all these particulars, hypochondriasis is exactly the opposite.

Treatment consists in exercising the greatest patience with the one affected

expressing sympathy and encouragement, and never dwelling on the fact that the symptoms are imaginary. Internal medication is useless, though a placebo is not amiss. Hydrotherapy, massage, and gymnastics are of value. Sexual intercourse is *not* to be considered of therapeutic value, as has been claimed. Gynecological treatment is to be avoided as far as possible. The diet should be mild and unirritating; alcohol being given in small quantities, if at all, and the amount of flesh eaten being restricted. Mental diversion is of great importance, travelling being particularly useful. The author, however, is not in favor of sojourn by the sea or of long sea voyages. Only under exceptional circumstances should the patient be committed to any institution.

THE TREATMENT OF PNEUMONIA WITH INHALATIONS OF CHLOROFORM.

CLEMENS (*Therap. Monatsh.*, 1889, 177) calls attention to the cases of pneumonia which he reported forty years ago, forty-two in number and all of severe type, which were treated by inhalations of chloroform.

Only two cases died, one of them a heavy drinker, and the other a very cachectic individual. In the years which have intervened between then and now he has treated all his cases of pneumonia in the same way, and without a single death. This favorable result he believes is due to the fact that he saw the cases early in the disease, and that he carried out the treatment energetically and persistently from the beginning. In every instance the chloroform was mixed with spiritus vini rectificatus, both to prevent its decomposition and to avoid narcotizing the patient. Even in very severe double pneumonia a favorable result was obtained by the continuous inhalation of the spirits of chloroform. The inhalations produce a complete change of the blood and by defibrinating it interfere with the local process. It is on this account that cases treated in this way seldom develop hepatization, run a short course, and often exhibit a remarkably rapid disappearance of the entire process in the lungs. The duration and number of the inhalations depend on the extent and intensity of the pneumonia, being longer and more frequent though containing more alcohol in the severer cases. It is important to have chemically pure chloroform. A firmly twisted piece of cotton should be saturated with the mixture of chloroform and alcohol, enveloped in loose dry cotton and held at about the thickness of the hand from the mouth and nose, in order that the patient may always inhale air with the vapor of the mixture.

THE RELATIONSHIP EXISTING BETWEEN HUMAN AND BOVINE TUBERCULOSIS.

E. F. BRUSH (*Boston Medical and Surgical Journal*, No. 19, 1889) after having for several years made a close study of the affection, including the consideration of all available statistics and the habits of people where it prevails, has come to the conclusion that the only constant factor is the presence of in-bred dairy cattle. Where these are not, he has found human tuberculosis to be absent. He gives a number of statistics to prove this position; among these the prevalence of the disease among the Hottentots, where a number of distinct breeds of cattle are raised. The same is true of

Ireland and Denmark, where the number of cattle is large. In Iceland, where the cattle are few, the disease is very rare, though the climatic conditions are almost identical with those of Denmark. In the portions of Greenland where dairy cattle are common, phthisis is prevalent; while in those in which the number of cattle is extremely small, the disease is almost unknown. Phthisis was unknown in Australia until after the introduction and breeding of cattle. The author cites quite a number of other instances. From the statistics produced, he concludes that there is little doubt that in-bred cattle are the chief etiological factor in the production of human tuberculosis. They foster the germ, prevent its extinction, and sow it abundantly in the human race. No other germ has so hard a struggle for existence in man as has the tubercle bacillus, as shown by the fact that of the immense number exposed to its contagion comparatively few take the disease. On the other hand, the in-breeding of cattle has made these delicate, and a very large proportion of them are infected by the disease. He believes that the disease was originally derived from the bovine species, and that were it not for cattle it would die out.

THE USE OF OZONE IN THE TREATMENT OF PHTHISIS.

About a year ago RANSOME reported his experience in three cases of phthisis treated by regularly given inhalations of ozone. He now (*Manchester Medical Chronicle*, May, 1889) adds detailed accounts of thirteen more cases. The treatment consisted in the daily inhalation of the contents of one or more cylinders, each containing in the neighborhood of seven litres of pure oxygen, ozonized up to about nine per cent., and under a total pressure on the cylinder of six to eight kilogrammes. All of the patients were inmates of the Manchester Hospital for Consumption, and were under favorable hygienic conditions. Of the thirteen cases under observation for one to two years, only two distinctly deteriorated. The author states that though he has had very gratifying results from other methods of treatment in the Hospital, he does not remember any so good as those now reported. There was unusual freedom from fever, absence of night-sweats, diminution in the amount of expectoration, improvement in appetite and in sleeping power, and gain in weight. The ozone, however, does not appear to act as a germicide. The author doubts whether we shall ever discover any means of reaching the bacillus in the consolidated exudations of phthisis, but he does believe that ozone may have a beneficial action on the general health of the patients, and that it may help the healthy lung to resist further inroads of the germ, and may even cause the latter to die out in the parts already attacked.

INTRA-PULMONARY INJECTIONS IN PHTHISIS.

V. Y. BOWDITCH (*Boston Medical and Surgical Journal*, No. 19, 1889) reports two cases of phthisis in which intra-pulmonary injections appeared to be of great benefit.

The first case, a man suffering from an acute phthisical process, severe cough, fetid expectoration, and increasing emaciation, exhibited immediate improvement in all respects after an intra-pulmonary injection. Three subsequent injections were given during three months, producing a complete arrest of

the disease, and renewal of health during four months. At the end of this time there was a sudden reappearance of the disease, unrelieved by injections. The fluid used for injections was Lugol's solution, or a mixture of carbolic acid and camphor, or one of iodine and carbolic acid, or a solution of corrosive sublimate.

The second case was one of advanced phthisis, in which the injections gave very great relief to the cough and expectoration, with remarkable changes in the physical signs within a few hours after the operation, though the fatal course of the disease was not arrested.

The writer feels justified in concluding that the treatment undoubtedly produced temporary recovery in the first case, which might very possibly have been permanent had not the patient led a dissolute life, and kept himself out of the open air. In the second case the injections at once exhibited a remarkable power of drying up the contents of the cavity into which they were made.

THE INDICATION OF THE ANACROTIC PULSE.

BENCZUR (*Prag. med. Wochenschr.*, 1889, xiv. 148) in considering the anacrotic pulse comes to the following conclusions:

1. The severe disturbances of compensation in which the pulse takes on the anacrotic form are the result of heart-weakness from exhaustion of the cardiac muscle or degenerative changes of the myocardium.
2. The anacrotic pulse indicates a grave prognosis in cases of heart disease.
3. In patients with a pulse of this character the bad condition of the heart muscle forbids the employment of Oertel's method of treatment.
4. Drugs with cumulative action, as digitalis, are to be withdrawn as soon as the pulse loses the anacrotic type, but should be again employed if the anacrotism return.
5. In administering new drugs whose action is not known, the disappearance of the anacrotism is a proof that the drug increases the force of the cardiac muscle.
6. Sphygmographic curves have no value as means for differential diagnosis of the individual valvular affections, but the anacrotic type permits under certain conditions the drawing of conclusions regarding the state of the heart muscle.

CHLOROFORM INHALATION AS A SEDATIVE IN PULMONARY AND CARDIAC DISEASES.

O. ROSENBACH (*Therap. Monats.*, 1889, 175) says that the advantage of the inhalation of small quantities of chloroform in certain conditions consists chiefly in that the procedure can be tried in those cases in which it is desired to cut short attacks which are often repeated, or where a substance is desired whose action is rapid and whose dose can be easily regulated. Chloroform is useful in asthmatic attacks of all kinds in patients with diseases of the heart and lungs, being especially useful in the dyspnoea of emphysema and in true cardiac asthma. Singultus and certain attacks of cardialgia of moderate intensity are sometimes benefited greatly, though morphia is usually to be preferred in these conditions. To administer chloroform the author puts five to

fifteen grammes on cotton pushed into a test-tube, and has the patient inhale slowly, holding the apparatus not too near the nose. Even attacks of œdema of the lungs may sometimes be arrested in this way.

STOMACH-WASHING IN INFANTS.

A. SEIBERT (*Arch. of Pediat.*, April, 1889) says that though the treatment of gastro-intestinal disturbances in infants by lavage was recommended by Epstein some years ago, but few physicians have followed his practice, though it has been attended by very favorable results. The indications for this treatment are the following:

1. In dyspepsia of infants, characterized by regurgitation of food after meals together with no or but slow gain in body-weight. When this condition is not remedied by regulation of the diet, the stomach will gradually grow weaker, and the children ultimately become shrivelled and withered. A single washing of the stomach will sometimes stop the vomiting and cure the case. The author has treated twelve children belonging to this class. One of them was but seven weeks old and had wasted until it weighed but three pounds. Only two siphonings were required, and the child convalesced without further medication.

2. In acute gastro-intestinal catarrh, or cholera infantum, the washing out of the stomach, as soon as possible after the vomiting has commenced, will often save the life of the child. He has treated twenty-nine cases in this way, and with but four deaths; these occurring in cases already too far gone when the treatment was commenced. There was no evidence that the treatment depressed the patient, but rather that it exerted a stimulating influence. Within a few minutes after washing, the children, without exception, go to sleep quietly for several hours. In twenty-five of the cases vomiting ceased immediately and permanently after the washing, even when milk was given within three hours after. It is the mechanical diluting of the poisons in the child's stomach and the rapid removal of these from the body which constitute the action and value of lavage.

3. In cases of chronic catarrh of the alimentary tract lavage has given better results than any other method of treatment. The process need not be repeated more than two or three times at intervals of forty-eight hours, but irrigation of the large bowel should also be performed three times a day. The author has thus treated fifty-two cases of chronic gastro-enteritis, with recovery in every one. In all of them medicine was used very little and only symptomatically.

Regarding the method employed, the author uses only plain warm water, if possible previously boiled. He passes a soft catheter into the stomach in the usual manner, and then connects this with a tube from a fountain elevated sufficiently to furnish the requisite pressure. After the stomach has been filled, the stop-cock is turned, the tube separated, and the contents siphoned out. The process must be repeated until the water comes back clear.

SYPHILIS OF THE INTESTINE.

HAYEM and TISSIER (*Rev. de Méd.*, April, 1889) review the published cases of this affection, and report a new instance of it occurring in their own ex-

perience. From the combined study of these they conclude that though syphilis of the intestine is unaccountably rare, it may be that cases will become more common when the appearances and characteristics of the affection become better known. Syphilis attacks preferably the large intestine and the terminal portion of the small intestine, and is localized often in its lymphoid structures. It is characterized by great cellular infiltration, very marked vascular lesions, and the production of ulcers with thickened borders and "lardaceous" bases, and which are filled with a yellow puriform mass. All the coats of the intestine participate in the morbid process. The serous coat is often roughened, thickened, and covered with false membrane. In a certain number of cases, in which the process is already old, there may be observed by the side of the lesions in process of development of the syphilitic ulcers, cicatrices which are fibrous, retracted, stellate, and which, without being limited to syphilis, constitute, nevertheless, a distinctive character. What has been said relates to anatomical diagnosis. The cases reported have been too few to determine the symptoms with accuracy. Diarrhœa has been present in almost all the cases; and this has been severe, obstinate, and prolonged for months, ending in a cachexia, or, as in the authors' case, in a typhoid condition. The stools are often streaked with blood, indicating ulceration, and suggest the presence of a syphilitic intestinal affection in the absence of tuberculosis, typhoid fever, dysentery, leukæmia, or enteritis of other forms, and in the presence of syphilis of other parts of the organism. The authors say that their own case shows that besides the essential syphilitic typhosis of Fournier, there may be a syphilitic typhosis symptomatic of ulcerous lesions of the intestine.

OLIVE OIL IN THE TREATMENT OF GALL-STONES.

The use of olive oil in large doses by those afflicted with biliary colic has been in popular vogue for many years, without having found its way to any extent until recently into general medical practice. The mode of action of the oil was supposed to lie in its passing through the common duct into the gall-bladder, and there effecting such a softening of the calculi as would enable these to pass into the intestine.

CHAUFFARD and DUPRÉ (*Gaz. Hebdom.*, 1888, No. 48) have subjected this form of treatment to a critical examination, and have found that while there is absolutely nothing to prove the correctness of the just-mentioned hypothesis regarding the mode of action of the oil (as was *à priori* to be expected), that it is nevertheless a fact that the free use of the oil leads to a general amelioration of all the symptoms, and hence they recommend that this form of treatment be given a trial.

In their experimental work they found that in dogs, rabbits, and other animals into whose stomachs olive oil was injected with a sound, no oil could be found in the gall-bladders. And gall-stones suspended in olive oil changed neither in appearance nor consistency. The masses thought to be softened calculi, appearing in the movements soon after taking the oil, were found to be remains of undigested food mixed with saponified oil.

DR. W. T. PORTER, of St. Louis (*Weekly Med. Review*), rejects the alleged efficacy of oil in cholelithiasis, attributing its vaunted success to errors in

diagnosis: gastric, intestinal, intercostal, pleural, etc., pains being mistaken for biliary colic, and the cessation of the pains being ascribed to the passage of the offending calculus, a supposition to which all the color of verity is given by finding in the stools the calculus-like bodies described above. Dr. Porter is unwilling that any case should be positively regarded as one of cholelithiasis "unless a stone is found in the feces, or unless an exploratory operation is done." And in his summing-up he further says: "The so-called olive-oil treatment should be abandoned, because it implies a special virtue in the oil which the oil does not possess, and a reliance on which tends to prevent the use of rational methods."

ON THE TREATMENT OF CHRONIC URÆMIA BY MORPHINE.

STEPHEN MACKENZIE (*British Medical Journal*, April 13, 1889, 837) reports two cases illustrating this plan of treatment. In the first patient, a case of severe Bright's disease, there suddenly developed intense dyspnœa, cyanosis, weak cardiac action, and great mental excitement. Nitrite of amyl, ammonia, alcohol, and ether were used without relief. Morphia was then given hypodermatically, with very prompt benefit. Several subsequent attacks were treated successfully after the failure of other remedies. In a second case the uræmia was manifested by headache, nausea, breathlessness, and irregular action of the heart. Various remedies were employed without effect, but morphia, in many attacks of this nature, rapidly alleviated the symptoms.

The author thinks that opium in renal disease is not necessarily so dangerous as often supposed. He concludes that (1) uræmia is a poisoning of the nervous system—a toxæmia; and (2) that the poison is developed within the body of the patient—autoxæmia.

The principles of treatment consist in (1) the elimination of the poison; (2) the counteraction of the poison; (3) the prevention of the retention of further poisons. The value of morphine is to fulfil the second indication. After discussing the nature of uræmic dyspnœa, headache, and convulsions, he concludes that the beneficial action of morphine is due to its freeing the bloodvessels from the spasm induced by the poison in the blood.

THE TREATMENT OF ENURESIS NOCTURNA.

BARUCH (*Arch. of Pediat.*, April, 1889) comments on the prevalence of nocturnal incontinence of urine in children, and the great difficulty universally found in controlling it. In the New York Juvenile Asylum, which cares for nearly one thousand children, the percentage of cases is about ten. Though the children thus affected have been kept in special wards, and roused once or twice in the night, and though all plans of treatment have been tried, no improvement appeared to be effected. Punishment the author believes to be cruel and unjust, and circumcision he deems useless in most cases, for the reasons which he explains; chief among them being that the girls of the institution suffered quite as frequently as the boys. The failure of medicinal and surgical treatment of the disease the author is disposed to assign to three causes: 1st. A difficulty of applying the remedies recommended to the theoretical indications laid down by writers. 2d. The impos-

sibility of applying these remedies to the parts supposed to be involved. 3d. The absence of evidence that the system, or the part affected, has really been brought under the influence of the remedies administered.

To the first cause of failure he has ceased to give further thought, as the theories proposed differ so widely. The third, and the second cause also, so far as internal remedies is concerned, he has succeeded in overcoming during the last twelve months by attending carefully to the necessity of bringing the system completely under the influence of the medicine given. He introduces no new drug, but employs the well-recommended belladonna, or rather its alkaloid, atropina. To obtain success it is necessary to produce the physiological effects of the drug. It is not required to administer the atropina during the day, but sufficient should be given at four o'clock in the afternoon and again at seven o'clock, if needed, to insure dilatation of the pupil. One-sixty-fourth of a grain for children from six to ten, and double the quantity for children up to fourteen, will usually suffice. If the afternoon dose has widely dilated the pupil by the evening, the second dose can be omitted. He has so far treated sixty boys in the Asylum in this way, and with surprising results. Although these boys had been in the wet-bed ward for from three months to three years, twenty-nine of them ceased wetting the bed after the first dose of atropine, and most of the others are rapidly improving.

PRESERVATION OF URINE FOR MICROSCOPIC EXAMINATION.

When it is desired for any reason to preserve urine for making a microscopic examination, WENDRINGER recommends the addition of a solution of boric acid in borax, made by dissolving twelve per cent. of boric acid in a twelve per cent. solution of borax. To the urine to be preserved, one-fifth to one-third of its volume of this solution is to be added.

DIAGNOSTIC VALUE OF PEPTONE IN THE URINE.

BRIEGER (*Inaugural Dissertation*, Breslau, 1888) as the result of a series of investigations found that the most common cause of the occurrence of peptone in the urine was the presence, somewhere in the body, of a focus of inflammation giving rise to the formation of pus—pyogenic peptonuria.

In croupous pneumonia peptonuria was of invariable occurrence, showing itself usually shortly before the critical fall of temperature. In pleurisy the occurrence of peptone points to the formation of an empyema. Whereas the absence of peptonuria with an established empyema indicates that there is some hindrance to resorption. Peptonuria complicating peritonitis points infallibly to the formation of some large, purulent deposit.

In meningitis, as already observed by von Jaksch, peptone is so invariably present where the meningitis is purulent, that its occurrence suffices to establish a differential diagnosis between this form and the tubercular.

In rheumatism the increase or diminution of the amount of peptone in the urine affords an index regarding the course of the resorption of the articular exudation.

Finally, Brieger calls attention to the fact that the recent discovery of Neumeister indicates that under certain circumstances peptone may be formed in the kidneys from the albumose of the blood. This he calls the nephrogenous form of peptonuria.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

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PHILADELPHIA, AND GERMAN HOSPITALS.

THE SUPPRESSION OF DRAINAGE IN MAJOR SURGICAL OPERATIONS.

At a recent meeting of the Société de Chirurgie (*L'Union Médicale*, May 9, 1889), JULES BÖCKEL read a communication upon the above subject. After having for some time left in his drains for twenty-four hours, he now had come to omitting them completely. He had at first done this only in minor operations, but now he employed no permanent drainage whatever. He gave the results obtained in thirty-three major operations of every sort, among which were extirpation of the breast, resection of the knee, amputation of the thigh, excision of cervical and inguinal glands, etc. Among his thirty-three cases he had but two deaths. One was from tuberculous meningitis and the other from pneumonia.

Most of the operations were exceptionally grave and complicated, as, for example, one for removal of the breast, the axillary glands, and the glands from below and above the clavicle, necessitating an osteotomy of that bone and a suture of the divided ends; no drainage was employed and the wound healed in fifteen days under one dressing.

In resection of the knee he obtained entire union of the wound without suppuration, in from twenty-five to thirty days. To procure these results he thinks the most essential factor is rigorous antisepsis during the course of the operation. He recommends washing the hands frequently in hot water and in sublimate solution, the avoidance of sponges, drying the wound with antiseptic gauze, using as few ligatures as possible, putting in sometimes a "pseudo drain" made of an absorbable crayon of iodoform, and, finally, using only a single dressing with firm compression.

In the discussion which ensued, Ségon thought that drainage should only be omitted in cases where there was complete asepsis, and in which it was possible to make prolonged compression.

Ollier, while often prompted to omit drainage in resections of the knee, had never dared to do so. He thought that in old cases where there are peri-articular purulent foci, it is not safe to dispense with the drains. We may adopt a middle plan in the use of absorbable drains, such as catgut threads, decalcified bone, etc.

Réclus has not employed drainage since 1887. He has had excellent results and has had few cases of suppuration.

TREATMENT OF EMPYEMA BY A VALVULAR TUBE HERMETICALLY SEALED TO THE CHEST.

DR. WILLIAM WILLIAMS describes (*British Medical Journal*, May 18, 1889) a method of treatment of empyema by means of a valvular tube, the prin-

ciple of which consists in the taking away of the atmospheric pressure from the external surface of the lung while the opening in the chest-wall still remains, and so enabling the organ to fulfil its functions and to fill up its side of the chest from the first, without waiting for any falling-in of the side to take place; in other words, to cause the lung to expand at the commencement instead of at the end of the treatment.

The method of carrying out this principle is the following: A rubber tube a yard and a half in length, and of a thickness that will admit of its being introduced through a canula of the ordinary size used to open empyemas, is taken, and one end is introduced into the chest by this means; over the tube, starting from the free end, is next run up an oval, slightly curved—concave toward the chest—metal plate or shield, three inches by two inches, having a metal tube half an inch long soldered in a hole in its centre, and projecting on the convex side only; through this the drainage tube passes as the shield is run up to the chest, and they should, of course, fit each other air-tight. Now, between the plate and the chest stiff ointment or dressing, or a layer of soft rubber jointing, or what not, is placed so as to form an air-tight joint, when the whole is finally firmly strapped down and bandaged.

At the free end of the drainage tube, there is fixed by means of a piece of glass tubing a valve that opens outward, and the contrivance is complete. The valve end of the tube when in use is placed in a bottle containing some antiseptic solution, as the valve acts best in a liquid, and the bottle forms a convenient and cleanly method of dealing with the discharge of pus. Lastly, once or twice each day the valve is removed and the chest washed out by simply elevating and lowering the bottle and changing its contents.

It is essential that this should be done often at first, to thin the pus, which is then frequently very thick, presenting while in that state greater difficulties to its expulsion through the valve than when more fluid, and no obstacle should on any account be allowed to cause a postponement of the application of the valve for a single day.

Dr. Williams reports three cases in which the results were most favorable.

RETROGRADE DILATATION OF STRICTURES OF THE ŒSOPHAGUS.

HAGENBACH (*Correspondenz-Blatt für Schweizer Aerzte*, No. 5, 1889) reports two cases of stricture of the œsophagus in which dilatation by the mouth was unsuccessful in relieving the patient, but which yielded to bougies passed from the stomach after the operation of gastrostomy.

The first case occurred in a fifty-two year old stonecutter. The patient's father died of consumption. Patient himself healthy excepting one attack of typhus fever. Suffered from lung trouble for some years. This was diagnosed as fibroid phthisis. In July, 1887, he noticed that he could no longer swallow large morsels of flesh or other solid food. The particles remained for some time near the stomach, and then together with some phlegm were eructated. The dysphagia steadily increased, so that in October the patient could only eat moistened bread and spoon-food. At this time there were occasional pains in the region of the sternum. For five weeks he has been able to take fluid nourishment only in small mouthfuls at a time. Present condition; exceedingly cachectic and greatly emaciated. Slight

swelling of the supra-clavicular and inguinal glands. Physical signs of fibroid phthisis. On sounding the cesophagus a firm resisting point is found thirteen inches from the dental arch. After prolonged and somewhat painful effort, an English No. 5 sound was passed. Weight of the patient 105 pounds (normal weight 119 pounds). In ten days a No. 12 sound could be passed through the stricture and the patient had gained eight pounds; but in spite of daily sounding there was a constant narrowing of the stricture, so that frequently the smallest sounds could not be passed.

Since it was very clear that no improvement could be hoped for by the use of bougies and that the patient was steadily losing strength from starvation, gastrostomy was performed. An incision was made in the left epigastrium parallel to the lower margin of the ribs, a portion of the stomach-wall was selected as near the cardia as possible, and its serosa was sutured to the parietal peritoneum by twelve threads; the wound was tamponaded by iodoform gauze, and four days later the stomach was opened by an incision one-third of an inch in length. The edges of this wound were then sutured to the skin incision. After the operation liquid nourishment was administered by means of the fistula and also by the mouth. There was no marked vomiting—no fever. In ten days the patient swallowed a shot to which a small thread was attached. This thread was hooked from the stomach by means of a bent probe and to its distal end was attached a strong silk ligature which was drawn past the stricture, so that one end projected from the mouth and the other from the gastric fistula. To this ligature was now attached a No. 7 sound, which was drawn into the stomach and upward through the stricture without requiring much force or giving the patient a great deal of pain. This sounding from below was continued daily, until in ten days a No. 12 sound could readily be drawn through.

The patient experienced no pain from this operation but simply suffered from an irritative cough lasting for some minutes. He was able to take semi-liquid nourishment. The gastric fistula was fairly well closed by means of a tracheal canula held in place by an elastic bandage. In one month a No. 12 cesophageal sound was readily passed without using the guiding ligature from the stomach up to the mouth. The ligature was now withdrawn. Frequent efforts made at sounding from above were unsuccessful. A month later, by means of a sound passed from the stomach through the stricture, a sound from above was guided through the latter. This method of sounding was continued for another month, until the patient could swallow finely chopped meat and steadily gained in strength. Finally a No. 6 bougie was successfully passed from above without guidance from below, and at the same sitting the dilatation was continued up to a No. 10. In a few days a No. 14 was passed and the patient instructed in its use. Since the stricture showed no further tendency to contract, and at times great irritation of the skin was produced by the stomach contents, the gastric fistula was finally closed, the mucous and serous surfaces being sutured separately. The patient was nourished by enemata for three days, a little iced milk only being taken by the mouth. A No. 7 sound was then passed through the stricture which was in three days run up to No. 14, and the patient left the hospital in a comfortable condition, passing the sound daily himself. The diagnosis was malignant stricture. He died later of phthisis, when this diagnosis was confirmed.

The second case was that of a child eight and a half years old. In October, 1885, she had taken a swallow of sulphuric acid. After an illness of some weeks, during which she vomited blood and had so much difficulty in swallowing that nutrient enemata were required, she recovered sufficiently to be nourished by liquid food. The difficulty in swallowing steadily increased, so that finally only the smallest sounds could be passed into the stomach. The use of the instruments was exceedingly painful and always caused some bleeding. In eight months the patient began to regurgitate fluids. Four months later persistent sounding caused such improvement that a No. 5 bougie could be passed and she was again able to take semi-solid food. In spite of most careful attention contraction again took place, liquid nourishment was taken with increasing difficulty, and a portion of what was swallowed regurgitated immediately. The patient assisted swallowing efforts by stroking and kneading the neck with both hands, but was successful in forcing only a very small portion of the liquid through the stricture. Emaciation was rapidly progressive. On examination, August, 1887, the sound encountered an impassable obstruction six and a half inches from the dental arch. A No. 4 Charrière bougie was passed beyond this obstruction but encountered another three inches further down. The passage of bougies was attended with great difficulty, and no appreciable dilatation was accomplished by them. From the middle of November sounds could no longer be passed. Yet she was able to swallow liquid and semi-fluid nourishment fairly well, and her general condition was greatly improved. This improvement was only temporary, dysphagia became so pronounced that frequently she took no food for a day at a time. By June of 1888 she had emaciated almost to a skeleton, the stricture was impermeable, the liquids were regurgitated *in toto* either at once or after a short interval. After the employment of nutrient enemata for a short time gastrostomy was performed.

Operation as before. An opening a fifth of an inch long made two days afterward in the stomach wall. Three weeks later she drank some milk, general condition greatly improved. A few days later she swallowed a shot to which a thread was attached; the shot was caught in the stricture, but a loop of the thread passed through and was drawn out through the gastric fistula. By means of this thread a silk ligature was drawn through the mouth and œsophagus till its two ends projected from the stomach and mouth respectively. Dilatation from the stomach was regularly practised. In a few days a No. 5 sound was passed in this way, without causing either pain or bleeding. After No. 7 was passed the patient was nourished entirely by the mouth. Three months later, after considerable difficulty, a No. 7 soft Nélaton catheter was passed by the mouth. The ligature was now withdrawn, and after a few days the soft bougie had threaded upon it a thicker English sound, which was thus guided through the stricture. This treatment was continued daily for about two weeks, when the patient aided by swallowing efforts was able to pass an English No. 9. Two weeks later the gastric fistula was closed. The patient has since been passing daily a No. 15 sound, has no difficulty in swallowing, and has gained eighteen pounds.

The value of retrograde dilatation is confirmed by successful cases reported by von Bergmann, Loreta, Kocher, Hjort, Caponotto, and Maydl.

CHOLECYSTOTOMY.

DR. R. W. STEWART reports (*N. Y. Medical Journal*, May 25, 1889) the case of a woman, æt. fifty-nine years, who had had symptoms of either biliary or renal colic for many years. They at last became so severe that operation was decided upon, and the appearance of jaundice determined the choice in favor of cholecystotomy.

An incision of about one inch in length was made in the fundus of the gall-bladder. It was noticed that the wall of the gall-bladder was abnormally thick and that no bile escaped from the incision. A calculus was found impacted in the cystic duct. The extraction of the calculus was attended with considerable difficulty, as it not only seemed to be impacted in the duct, but also encysted, for a firm fibrous membrane surrounding the calculus had to be torn through before the calculus could be seized. Once exposed, the calculus was easily crushed and removed piecemeal; it consisted chiefly of inspissated bile. After washing out the débris the incision in the gall-bladder was closed by a continuous catgut suture, and the liver allowed to assume its natural position. The peritoneal toilet was completed in the usual manner, and the abdominal wound closed with silver sutures. The patient made a rapid recovery.

The points of special interest connected with the case are: (1) The long duration of the trouble (thirty years). (2) The absence of marked jaundice at any time. (3) The presence of blood, pus, and bile in the urine, which obscured the diagnosis between renal and biliary calculi. (4) The impossibility of suturing the gall-bladder to the abdominal wound on account of its collapsed state and its distance from the border of the liver. (5) The thickening of the gall-bladder, probably due to hypertrophy of its muscular fibres, caused by repeated ineffectual attempts to expel the calculus.

ELECTRICAL ILLUMINATION OF THE BLADDER IN THE DIAGNOSIS OF
OBSCURE VESICAL DISEASE.

MR. E. HURRY FENWICK contrasts as follows (*British Medical Journal*, May 4, 1889) electric cystoscopy and digital exploration for diagnostic purposes, basing his comparison of the two methods upon two lists of forty-three cases each, one in the practice of Sir Henry Thompson, the other in his own.

1. Digital exploration is a cutting operation, needing confinement to bed. Electric cystoscopy can be performed routinely and rapidly in private or out-patient practice.

2. The former operation needs an anæsthetic. In the latter it is not absolutely necessary. In the greater number of cases Mr. Fenwick has neither used gaseous narcosis nor cocaine; he employs anæsthesia (*a*) in females for delicacy, (*b*) in tuberculosis or similar cases, where the prostatic urethra is extremely sensitive, (*c*) in order to make a leisurely prognosis of a discovered growth, so as to determine the expediency of operating.

3. Digital exploration is not absolutely free from risk of hemorrhage, and frequently either a troublesome fistula or a hyper sensitive scar is left in the urethra. Cystoscopy is, if it be gentle and purposive, as free from risk as routine catheterism or sounding.

4. In most cases the educated eye is to be preferred to, and relied upon, rather than the finger.

5. The cystoscope affords us not infrequently a sound prognosis, and intimates when to interfere and when to leave alone; if it indicates operative interference, it also points to the path (suprapubic or perineal) best suited for access to the growth, and for its complete eradication.

6. It must be readily admitted that digital exploration allows of the bladder being subsequently drained; but the rest thus afforded is not always necessary, nor is it always productive of benefit.

PROPERITONEAL INGUINAL HERNIA.

BUTZ (*St. Petersburg med. Woch.*, 1888, No. 38) makes the following propositions in regard to properitoneal inguinal hernia:

1. The hernia is usually congenital.
2. The testicle is atrophic; its descent incomplete.
3. There is either a swelling over Poupart's ligament, or a sense of increased resistance or tenderness on pressure.
4. There is atrophy of the abdominal walls at the seat of swelling.
5. After apparently successful taxis the abdominal pain becomes more intense.
6. After herniotomy the loops of gut lying in the scrotum cannot be reduced.
7. If replaced the loops of intestine again descend, or lie fixed in close proximity to the internal abdominal ring.
8. On dividing the properitoneal sac there is a discharge of hernial serum.

FORWARD DISLOCATION OF THE LOWER END OF THE ULNA AND UPPER END OF THE FIBULA.

DR. LEWIS STIMSON reports (*New York Medical Journal*, May 25, 1889) instances of these two rare luxations.

In the first the hand and wrist had been caught and squeezed between a dumb waiter and the framework around it. The hand was in complete supination and could not be pronated. The normal prominence of the ulna at the back and side of the wrist was lost, and on palpation the ulnar border of the lower end of the radius and the portion of the upper posterior border of the carpus corresponding to the ulna could be distinctly traced. The relations of the carpus to the radius and metacarpus were unchanged. On passing the finger from the fifth metacarpal upward along the dorsum and ulnar side of the carpus a bony lump (presumably the unciform) could be felt, and then a narrow, transversely elongated bone, which I thought to be the cuneiform. Above the latter was a deep depression, in front of which, on the front of the wrist, the lower end of the ulna could be felt. The triangular fibro-cartilage could not be recognized. Reduction was easily made.

In the second, the patient had sprung sideways to avoid being run over, and had felt a sudden, sharp pain below the knee at the outer side. The head of the fibula could be readily recognized, by the eye and touch, projecting on the outer side of the leg, with the tendon of the biceps showing promi-

nently as it curved downward and outward, its convexity directed forward and somewhat inward. The upper, outer, anterior, and posterior surfaces of the head of the fibula could be palpated readily. The distance from the head to the tuberosity of the tibia was one centimetre less than on the other leg, and the circumference of the limb just below the patella was one centimetre greater than on the other side. Reduction was easy.

THE OPERATIVE TREATMENT OF TUBERCULOUS JOINTS.

RIEDEL (*Centralblatt für Chirurgie*, No. 2, 1889, p. 341), after consideration of the question, whether the origin of tuberculous joint disease lies primarily in the bones or in the soft parts, and also discussing the functional results to be expected after the operation upon large joints of the extremities in children and adults, comes to the following conclusion :

1. Every osseous change which leads to the formation of a sequestrum necessitates operation at all ages. The presence of a sequestrum is chiefly indicated by the formation of abscesses, great pain, and the occurrence of contracture, but these symptoms are not always to be relied upon.

2. Every osseous change which limits itself to the formation of granulations, especially caseous foci without a sequestrum, as well as every case of primary tuberculosis of the soft parts, requires operative treatment. This is true in the case of adults over seventeen years of age, if these processes originated at that age, or if, beginning earlier, they have recently undergone exacerbation. It is true also in children, if the ankle- or wrist-joint is diseased.

3. If these two processes have their seat in either the knee or the elbow, operative interference should be postponed, if possible. If the shoulder- or hip-joint is affected they should still more carefully be avoided, especially in coxitis. Suppuration indicates operation in these cases.

As regards the operation itself, RIEDEL points out the following conditions as especially important: 1. The removal of the diseased tissues must be complete. For this purpose the joint must be freely opened by large incisions, and the synovial membrane removed with knife and scissors, not merely curetted. All fistulæ must be widely opened. He objects to partial operations, in which the radical removal of tuberculous tissues cannot be accomplished. 2. As every infection from without amalgamates the tuberculous tissues with those which surround them, the operation should be done, if possible, while the skin is intact. He protests energetically against operations limited to the opening of deep-seated abscesses of large joints, and ignoring the more radical operations upon the joint itself. 3. As drainage tubes always leave behind them cavities, which heal by granulation, and which sometimes favor a return of the disease through the development of spores or bacilli which have been left in the tissues, he recommends the avoidance of drainage so far as possible. This can only be done in aseptic wounds. In such wounds he does not drain large cavities in or between the ends of the bones, but leaves the wound, the deeper parts of which may undergo primary union, completely open. Only when broad even surfaces of bone are opposed to each other, does he sew up the wound, and use short, superficial drainage tubes in the incision. 4. To dispense with the drainage tubes the wound must be as simple as possible, adapted for rapid union, and all diseased parts

must be thoroughly removed. He opposes the attempts made by other surgeons to obtain complete restoration of function through removal of bony processes, while sparing the ligaments, believing it to be preferable to remove thoroughly the dangerous disease before making the restoration of function the chief object.

RUPTURE OF THE POPLITEAL ARTERY.

MR. A. R. ANDERSON reports (*The Lancet*, May 11, 1889) the case of a boy, aged fifteen years, whose knee had been crushed, with the result of rupturing the popliteal artery at about the origin of the superior internal articular artery. The hemorrhage which led to the diagnosis did not occur for two months. The patient was twice transfused when almost exsanguine. He ultimately recovered.

With respect to the treatment of this accident, the most satisfactory method appears to be that of cutting down on and tying the ends of the ruptured vessel, in both the incomplete form and also when complete, if the case be seen before gangrene has become inevitable. It is true that distinguished surgeons have occasionally, but very rarely, failed to find the ends of the vessel amid the mass of blood and debris. But in favor of this operation it may be said: (1) that it places the patient in the safest condition possible as far as the risk of any recurrence of the hemorrhage is concerned; (2) that by early clearing out of the masses of clot from the popliteal space a potent factor in the production of gangrene is removed—namely, the pressure on the collateral circulation; and (3) that, if gangrene should unfortunately ensue, amputation can easily be performed, with a scarcely diminished prospect of success. In partial rupture ligation of the femoral has been advocated. But the objection to the operation appears to lie in this, that if with an enfeebled circulation in the limb, such as must be present with a partially ruptured popliteal artery, the femoral is ligatured, the risk of gangrene would surely be as great or greater than if the vessel were cut down on and tied.

THE TECHNIQUE OF LIGATION OF THE INFERIOR THYROID ARTERY.

DR. RYDYGIER (*Centralblatt für Chirurg.*, No. 14, 1889) describes a new incision for securing the inferior thyroid artery when struma or other pathological conditions indicate the cutting off of the blood supply to the thyroid gland. His objection to the ordinary operation is placed mainly on cosmetic grounds, since as a result of incisions, four plainly visible scars are left in a conspicuous portion of the neck. In addition he claims that his method renders the operation much easier in performance, a careful following of his technique making this ligation no more difficult than that of the superior thyroid. Indeed, in some cases it is even easier.

The patient is placed in the dorsal decubitus, with the face turned away from the field of operation. An incision is made about an inch above the upper border of the clavicle and parallel to it; it should be about two and a half inches in length, and should be extended across the outer border of the sterno-cleido-mastoid so that the lesser half of the incision lies directly across this muscle. Having divided the skin, the platysma, and the superficial fascia, the index finger is thrust beneath the sterno-mastoid muscle; by

tearing it opens the connective tissue between the sterno-mastoid and the inner edge of the scalenus anticus. The great vessels with the vagus nerve remain upon the posterior surface of the sterno-mastoid, and are with the latter lifted upward by the finger. In this opening one or two straight, long, blunt hooks are inserted, and the muscles together with the vagus nerve are drawn directly forward and inward so that the opening gapes as widely as possible. If the tissues have been sufficiently freed from the scalenus, the pulsating thyroid axis can readily be seen at the inner border of this muscle, together with the inferior thyroid artery which makes a distinct curve inward. This vessel can be positively identified by the superficial cervical or the ascending cervical artery, which obliquely crosses the incision. With two long dissecting forceps the artery is isolated, and by means of a strongly bent aneurism needle, a double thread is passed around it, and it is tied in two places. By means of blunt dissection the operation is rendered easier and more rapid, and the relations are no more disturbed than when the knife is used. Neither excessive deposit of fat nor the presence of small glands renders the operation materially more difficult. Large glands must be removed. The phrenic nerve is usually exposed during this operation, as it passes downward and inward over the scalenus anticus muscle, but injury to it is almost an impossibility. Frequently the inferior thyroid artery is not so readily found at the inner border of the scalenus, being partly concealed beneath this latter muscle. It is readily exposed, however, by pressing the muscle aside.

Cosmetically speaking, the operation is most satisfactory; not only is the incision placed in a natural depression of the neck, but it lies so far down that it is concealed by the clothing. An oblique incision for the superior thyroid artery is also to be preferred, as it leaves a less visible scar than the ordinary cut.

RUPTURE OF THE TENDON OF THE QUADRICEPS FEMORIS.

DR. WILLIAM T. BULL narrates (*New York Medical Journal*, April 20, 1889) the recorded cases of this accident, and continues: These cases are too few to warrant our forming any conclusions as to the probable result of the immediate suture. But they demonstrate that the procedure has been thus far attended with no serious complications, such as suppurative synovitis. In one instance the recovery has been complete, and in two others there is every prospect of improvement; while the suture in open wounds—a rather more complicated condition to manage, since there is more danger of infection from the instrument inflicting the injury as well as foreign matters from the clothing and the exposure to the air—has been wholly satisfactory.

In view, then, of the uncertain functional results of the older methods of treatment and the encouragement offered by these few cases, Dr. Bull would certainly deem it justifiable and desirable to resort to the suture at once in many cases of rupture of this tendon. Where the ends are widely separated—say by an interval admitting two fingers—one might naturally expect a diminished power of extension caused by elongation of the tendon. Where the joint capsule is distended, one may properly assume that extravasated blood is present, and its absorption and the accompanying synovitis may lead to fibrous ankylosis and lessened power of flexion.

Cases that present either one or both of these conditions (and they will often coexist) should be treated with suture at once. On the other hand, ruptures in which there is a trifling separation of the ends of the tendon—say up to the width of an inch, or a finger's breadth—as well as those in which there is no effusion into the joint, should be treated by fixing the limb on a posterior splint, or incasing it in plaster-of-Paris, after drawing down the muscle and fixing it by bandaging from above downward. The patient may begin to walk at the end of four weeks. If the stiffness or lessened flexion continues, it may be overcome by passive motion. If the power of extension is found defective after the quadriceps muscle has regained its activity, it will be due to elongation of the tendon and a secondary suture of the tendon may then be undertaken.

OTOLOGY.

UNDER THE CHARGE OF

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EXFOLIATION OF A LARGE PART OF THE LEFT MEMBRANA TYMPANI, IN CONSEQUENCE OF A BLOW ON THE HEAD.

A man, twenty-eight years old, received a severe blow on the left temple from a falling object; thereupon there immediately ensued bleeding from the nose and left ear; severe pain was also felt in the anterior half of the head, and the patient became dizzy. The next day the bleeding continued, and an ecchymosis appeared over the mastoid. The membrana was bluish-red in color, and showed a large perforation, running from above and behind, forward to the upper third of the manubrium. The vessels of the latter were injected; the mucous membrane of the tympanic cavity was moderately swollen and red. Blood oozed from two points, viz., behind and below from the remnant of the membrane, and above and in front from the point where the loosened piece of the membrana was still connected with the rest of the membrane.

The treatment consisted in removal of the coagula of blood by syringing, inflation by Politzer's method, and the insertion of a tampon of iodoform gauze. The hemorrhage ceased in five days. The vertigo appeared only when the patient stood up. A sense of constriction of the head continued. In six days the torn piece of drum-membrane was detached spontaneously, and syringed out. It was six millimetres long and four millimetres wide. The treatment now consisted of two daily instillations of a four per cent. solution of boric acid and alcohol. The discharge ceased, and there ensued a total regeneration of the lost tissue in the membrana tympani. The hearing became normal. The duration of the case was eight weeks.—*Archiv für Ohrenheilk.*, Bd. 28, April, 1889.

A CASE OF PERIODICAL AURAL HEMORRHAGE WITH IMPERFORATE MEMBRANA TYMPANI.

EITELBERG reports a case of the above-named disease with the following characteristics (*Archiv für Ohrenheilk.*, Bd. 28, April, 1889):

An anæmic woman, thirty-seven years old, who had suffered from otitis media in childhood and in early adult life, and at the time of each new moon had severe headache, revealed, upon examination of the right ear, a cicatrix in the upper and posterior quadrant of the membrana tympani, the under half of the membrane being calcareous. On the left side, the membrana revealed two long, oval cicatrices, with a calcareous deposit in the lower anterior part. The hemorrhages, which usually came from the left ear, were usually preceded by pain, sensation of warmth, and itching. Sometimes the hemorrhages were induced by hard work; but often they occurred without any such cause. The hemorrhage occurred all at once, its quantity being about a fluidrachm. The pain ceased upon the occurrence of the bleeding. After the hemorrhage a few small bloody spots were discernible in the membrana. The opinion of the author was that these hemorrhages were in some way connected with menstruation, which was irregular in this case.

A CASE OF PRIMARY CROUPOUS INFLAMMATION OF THE EXTERNAL AUDITORY CANAL AND DRUM-MEMBRANE.

This case occurred in a man thirty-two years old, who for three days suffered with sharp pain in his left ear. (L. GURANOWSKI, Warsaw, *Monatssch. für Ohrenheilk.*, No. 7, 1888.) The author then removed from the auditory canal, by means of forceps, a semi-transparent, yellowish mass, of gelatinous consistency, which on one of its sides showed a bloody streak. It was insoluble in water, but looked like softened fibrin when subjected to alcohol. It represented a cast of the external auditory canal. The auditory canal was swollen, and in the deeper parts, near the membrana tympani, it was deeply injected. There was also a chronic purulent otitis media in the left ear. The ear was first syringed with a solution of boric acid, and afterward tampons of cotton-wool soaked with carbol-glycerine (1 to 10) were laid in the canal. Later, powdered boric acid was insufflated once daily, and in the course of ten days the ear healed. The croupous membrane was examined microscopically and microchemically, and showed the presence of fibrin, with lymphoid cells, micrococci, and a small number of bacilli. Cultures revealed the presence of the bacillus of green pus, the bacillus pyocyaneus, which seems to have much to do in the causation of otitis externa, according to Gruber.—*Archiv für Ohrenheilk.*, Bd. 29, April, 1889.

BACTERIAL DIAGNOSIS AND PROGNOSIS IN SUPPURATION OF THE MIDDLE EAR.

Moos in these cases has corroborated the suppositions of Zaufal, that in genuine otitis media the pneumo-bacillus of Friedländer and the diplococcus of Fränkel and Weichselbaum play an important part. Furthermore, he maintains that the discovery of the streptococcus pyogenes in the secretion from the middle ear is of the greatest importance, as the latter usually induces

complications in otitis which threaten life. Therefore Moos claims that by Zaufal's demonstration in this matter, a great gain in diagnosis and prognosis, in suppuration of the middle ear, has been made.—*Archiv für Ohrenheilk.*, Bd. 28, April, 1889.

GENERAL CONSTITUTIONAL AFFECTION PRODUCED BY THE BACILLUS PNEUMONIÆ, EMANATING FROM A SUPPURATIVE OTITIS MEDIA.

In a post-mortem examination of a woman fifty-four years old, WEICHELBAUM, of Vienna, found acute rhinitis, acute purulent inflammation of the left tympanic cavity and the mastoid, with perforation of the membrana tympani. There was also purulent periostitis of the mastoid process, and a phlegmon of the sterno-cleido-mastoid muscle, with commencing pneumonia in the left upper lobe, acute parenchymatous nephritis on both sides, fatty degeneration of the heart, an acute tumefaction of the spleen, and swelling of the liver. Also, general atheroma of the arterial system, and hypertrophy of the left ventricle of the heart. After the post-mortem examination, search was made throughout the specimens obtained, for bacteria. Cultures were made from the pus from the drum-cavity, the mastoid process, the nares, and from the œdematous fluid of the lungs. Also, by experiments upon animals, the author convinced himself that the form of bacteria found in the specimens was the bacillus pneumoniae, which were in such large numbers as to explain the manifestations of disease in the case.

The case supplies a desired proof and substantiation of Zaufal's view of the etiology of certain forms of otitis. The Eustachian tube forms the avenue of entrance of the bacillus and other bacteria into the middle ear.—*Archiv für Ohrenheilk.*, Bd. 28, April, 1889.

USE OF CREOLIN IN AURAL SURGERY.

Ten drops of creolin in a half litre of warm water has been used with success for syringing the ear in purulent otitis media by EITELBERG (*Wiener med. Presse*, No. 13, 1888). Stronger solutions cause temporary burning in the ear. Some of the same solution is used for instillation in the ear after syringing, the application being left in the ear for ten minutes. Injections with the Eustachian tube are forbidden, on account of the disagreeable taste of creolin. In cases of furunculosis in the ear, creolin salve has been used (2 to 100 of vaseline), but with less success than in eczema.—*Archiv für Ohrenheilk.*, Bd. 28, Parts 1 and 2, April, 1889.

DIPHTHERITIC INFLAMMATION OF THE DRUM-CAVITY.

In cases of diphtheria of the larynx and pharynx, the middle ear may be in a condition of collateral hyperæmia, or be affected by a catarrhal or purulent inflammation. S. HIRSCH, of Hanover, however, reports a case of genuine diphtheritic inflammation of the drum-cavity in a child one year and nine months old. Both membranæ were dull and thick, and their inner surface was covered by an infiltrated mucous membrane. The tympanic mucous membrane was greatly swollen, filling the cavity, and covered by a false membrane clinging tightly to its surface. A muco-purulent discharge came from the

fundus of the cavity. In the right sigmoid fossa there was found post-mortem a purulent deposit the size of a lentil, and in the transverse sinus a thrombus. Ecchymoses were discovered on the left tegmen tympani.—*Archiv für Ohrenheilk.*, Bd. 28, April, 1889.

THE USE OF CREOLIN IN PURULENT OTITIS MEDIA.

IGNAZ PURJESZ (*Gyógyászat*, No. 52, 1888) has employed five or six drops of creolin to a litre of water, once or twice daily, for syringing the ear, and he has found that in this strength it does not irritate nor prove unpleasant in any way. Concentrated solutions, however, produce a burning in the ear. The same solution may be used in other acute and chronic inflammations of the middle ear for syringing and for washing out the drum-cavity *per tubam*, whereupon the discharge soon ceases. The experience of some aurists has not been so favorable with creolin.—*Archiv für Ohrenheilk.*, Bd. 28, 1889.

COMPLETE AND SUDDEN DEAFNESS IN ALBUMINURIA.

GELLÉ relates the following case of the above-named form (*Société de Biologie*, March 24, 1888). The disease was noted in a woman fifty years old, who, some years previously, had suffered from paresis of the recurrent on the right side, and who, during her convalescence from a tedious bronchitis, had become suddenly deaf in the course of forty-eight hours. No lesion could be detected in the sound-conducting apparatus. There was constant and excessive tinnitus. The patient had never suffered from vertigo. Traces of albumin were found in the urine. Fourteen days later there occurred œdema of the legs, and in eighteen months the patient died with typical symptoms of albuminuria, the deafness and tinnitus having remained unaltered. There was no autopsy. Gellé suggested that probably a tumor had pressed upon the right recurrent nerve and had produced a bulbar lesion, which in turn had caused the albuminuria and deafness.—*Archiv für Ohrenheilk.*, Bd. 28, April, 1889.

AUDITORY HALLUCINATIONS IN CONSEQUENCE OF AUDITORY LESIONS.

G. BALLET reports the following case (*Annales medico-psychologiques*, 1888). In a man thirty-eight years old, tinnitus was complained of, first in one ear then in both, which was soon followed by hallucinations. The hearing of the patient remained good. He imagined himself the toy of an evil spirit.

The author claims that in this case, as in all other instances of auditory hallucinations, an affection of the auditory apparatus lies at the base of the trouble, but that the occurrence of the hallucinations is favored by a nervous predisposition. The noises in the ear in this case began after intense mental excitement.—*Archiv für Ohrenheilk.*, Bd. 28, 1889.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF
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LARYNGEAL PARALYSIS.

An unique instance of rapid extension of posticus paralysis to complete paralysis of the recurrent has been reported by MARTIUS to the Berlin Laryngological Association (*Berliner klin. Woch.*, April 29, 1889). A boy, thirteen years of age, had had diphtheria. During convalescence fever became suddenly reestablished on the twelfth day of the disease, with hoarseness, and slight tendency to regurgitation, fluids returning through the nose. The vocal bands were reddened, and the left band showed slight impeded movements without definite indications of paralysis. On the sixteenth day, at 10.30 A.M., this band was found immobile in the median position, with no trace of abduction in respiration, and with a very slight motion toward the right in intonation. A few hours later the vocal band was found immobile in the cadaveric position. At 3 P.M. death occurred unexpectedly under continually increasing cardiac failure. The autopsy revealed perineuritis and neuritis in the left pneumogastric, parenchymatous myocarditis, endocarditis, thrombosis of the cerebral sinus, and pachymeningitis. The right pneumogastric was altogether normal, while the left one was infiltrated with pus for two or three centimetres at the level of the larynx, the perineurium being affected, as well as the nerve itself. There were no changes in the cranial portion of the nerve, although the pachymeningitis was considerable. The development of the paralysis here took place under the eye of the observer in accordance with the explanations of Rosenbach and of Semon.

The difficulty sometimes found in differentiating morbid growths from aneurisms as the cause of a laryngeal paralysis is well exemplified in the two cases following:

MARTIUS reported to the Berlin Laryngological Association (*Berliner klin. Woch.*, April 29, 1889) an instance of left-sided recurrent paralysis in a laboring man, forty-eight years of age, the physical symptoms attending which indicated aneurism of the arch of the aorta; even to a pulsating tumor and apparent lack of synchronism in the radial pulsations. Death occurred suddenly a few days later. Carcinoma of the œsophagus was found, with extension over the larynx. There was no trace of the pneumogastric to be detected in the purulent cancerous mass; but beyond this point the nerve was infiltrated with copious, thick, turbid fluid.

In the discussion, Lubinski mentioned a case of paralysis of the left vocal band in cadaveric position, with cardiac palpitation and sudden paroxysms of dyspnoea and of difficult deglutition. The physical signs pointed to aneurism of the aorta, being dulness to the right of the heart, projection of the

heart some little distance beyond the middle line, and a loud systolic murmur over the sternum. Bloody expectoration began a few days later, and the patient died soon after. A carcinomatous tumor was found which had involved the arch of the aorta and the recurrent nerve.

LARYNGOFISSURE.

In his concluding article on the statistics of laryngofissure (*Münch. med. Woch.*, April 30, 1889), DR. KARL BECKER, of Marktzeuln, discusses the results in one hundred and twenty cases: fifty-seven for papilloma and fibroma, nineteen for carcinoma, three for sarcoma, eleven for foreign body, and thirty for stenoses of various origin, membranous adhesion of vocal bands, and stenoses following typhus, syphilis, tuberculosis, chondritis, and perichondritis. Seven patients died after the operation; one of them, only, in consequence, an anæmic man who succumbed in collapse the day after an operation for carcinoma. Of the other six, one died from diphtheria of the wound, one from croup of the bronchia, and three from pulmonary œdema due to flow of blood into the lungs. In one of these three the trachea had not been tamponed, and in the other the tamponing had been incomplete. All the remaining one hundred and thirteen recovered thoroughly from the operation, the average in the later cases (the antiseptic period) being from ten to eighteen days, thus indicating that laryngofissure is not an essentially dangerous operation.

The final result of the operation depends upon the cause which renders it necessary. After extraction of foreign bodies the functions of the larynx become fully reestablished. If stricture supervenes, it will render dilatations necessary. In strictures the result depends upon their character and extent; radical relief is not always attainable and in such cases patients may have to wear a canula permanently. In tuberculosis it always gives relief even when it merely postpones death. A tuberculous patient in whom Hopmann performed laryngofissure and cauterized the ulcerations was still fulfilling his duties as a preacher, however, eleven years after the operation. In cases of tumors, good results will depend upon thoroughness of removal of the morbid tissues, and the liabilities to recurrence or to new growth.

LARYNGECTOMY.

DR. REGNIER reports (*Journ. Méd. de Breslau; Abeille Méd.*, April 15, 1889) a case of total extirpation of the larynx for carcinoma, in a man sixty years of age. For more than a year there had been progressive hoarseness and dyspnœa; but the diagnosis could not be made out (!) owing to inflammatory tumefaction of the superior orifice of the larynx and the absence of symptoms of cachexia. Tracheotomy was performed, December 17th, on account of imminent asphyxia. Three weeks later a small, hard tumor appeared at the side of the tracheal incision and adherent to the trachea. Microscopic examination revealed keratoid carcinoma. Total extirpation of the larynx was performed March 7, following. A second tracheotomy was first made as low down as practicable. The larynx was then freed on both sides, the thyro-hyoid ligaments were severed, and the trachea was severed at the level of the sternum, and attached by suture to the skin. The epiglottis being

healthy was left, but a large portion of the left sterno-thyroid muscle had to be removed, having become invaded by the carcinoma. At the date of report, three days only, the patient was doing well. The cavity of the excised larynx was found to be completely occluded with a neoplastic tumor which had invaded the trachea, and which seemed to have originated in the posterior part of the organ. At the left side of the thyroid cartilage the carcinoma had emerged by an opening the size of a pea, and it was at this point that the sterno-thyroid muscle had been invaded.

At a meeting of the Clinical Society of London, April 26th (*Lancet*, May 4, 1889), DR. GREVILLE MACDONALD and MR. CHARLES SYMONDS reported a case of total extirpation of the larynx for epithelioma, with recovery, and with preservation of a useful voice without the aid of artificial reeds; the vibrating structures being two folds of pharyngeal mucous membrane running antero-posteriorly from the epiglottis. The patient, a man forty-one years of age, was in good health, and without recurrence four months after the operation. Some eight months previous to the extirpation Dr. Macdonald had removed, by intra-laryngeal procedure, a large neoplasm occupying the anterior three-fourths of the epiglottis; an external operation, deemed necessary by him, having been declined. Six months later Mr. Charles Symonds had removed a recurrent growth by external access; and the extirpation of the larynx had become necessary seven weeks later.

ON CURETTING LARYNGEAL GROWTHS.

PROF. F. MASSEI, of Naples (*Journ. Lar. and Rhin.*, February, 1889), refers to the recommendation of curettes by von Bruns, in 1865, in his work on *Laryngoscopy and Laryngoscopic Surgery*, and to the plain sharp spoons and the scissor-like scrapers used by Rossi, of Rome (*Lo Sperimentale*, February, 1887). He cites an instance in which Wroblewski successfully removed a large papilloma from the lower part of the epiglottis by a single curetting, after having performed tracheotomy. He then mentions the value of the curettes used by Heryng for scraping away tuberculous portions of the larynx which he has used with success in removing papillomas, both large and small. Illustrations are presented of all these instruments. He concludes that curetting deserves better appreciation than it has received; that it is very serviceable in growths situated in the subglottic region, and on the vocal bands, or on their free edges; that it removes portions of the tissue from which the growths have originated, and permits more direct treatment afterward with local agents, of which lactic acid is the most preferable, and thus gives greater security against recurrence.

TRACHEOTOMY.

In an excellent essay on the relative merits of early and late tracheotomy in chronic disease of the larynx recently read at the British Laryngological and Rhinological Association (*Journal of Laryngology and Rhinology*, April, 1889), MR. LENNOX BROWNE discusses the operation in connection with chronic inflammation and perichondritis, lupus, tubercle, syphilis, benign growths, malignant growths, and neuroses. After a comprehensive considera-

tion of the comparative merits of the procedure in association with these affections, doubly valuable as the matured views of an accomplished laryngologist of decided surgical ability, the following conclusions are announced :

1. Early tracheotomy, with retention of the tube, is advocated in chronic subglottic laryngitis and in perichondritis causing subglottic stenosis.

2. Tracheotomy, either early or late, is not advocated in tuberculous laryngitis.

3. It is but rarely necessary in lupus.

4. In œdema occurring during the course of a syphilitic laryngitis it is to be performed only after patient treatment has failed, and when performed for such a condition there is a fair chance that the tube may, after a time, be dispensed with. Tracheotomy is preferable to attempts at dilatation in the case of syphilitic stenoses, and the tube has generally to be retained for life. Not unfrequently the operation fails on account of inability to reach the seat of stricture.

5. The operation may be necessary in benign growths of the larynx ; and, when indicated, is better performed early.

6. Early tracheotomy is strongly advocated in malignant disease of the larynx as the safest and surest means of prolonging comfortable life, and in this respect as superior to attempts at radical extirpation.

7. Tracheotomy is necessary in cases of bilateral paralysis of abduction, and should not be delayed if treatment fails to arrest the progress of the disease. It is seldom successful in cases of dyspnoea caused by pressure low down in the trachea.

DR. CROFF, of Nürnberg, publishes (*Münchener med. Woch.*, April 9, 1889) a contribution to the statistics and indications for *tracheotomy in diphtheria and croup*. Twenty-four cases terminated fatally out of thirty-nine operations, 9 out of 11 under two years of age, 9 out of 14 between two and four years, 6 out of 7 between four and ten years and one case at ten years of age terminated successfully. Only three of these were cases of genuine laryngeal croup, and these three recovered. In general the operations were performed at a very late stage. Croff analyzes the physical signs on percussion and auscultation as indications for operation, and furnishes some details as to the definitive removal of the canula in his cases, and the post-mortem results in some of them.

DR. SEIFERT, of Würzburg (*Münchener med. Woch.*, April 29, 1888), in his article on "Tracheotomy in Tuberculosis of the Larynx," presents an excellent summary of the opinions of various observers ; from which, in connection with the detail of four cases in his own experience, he concludes that improvement, and now and then cure, results ; that life is not only prolonged, but is rendered more comfortable ; that the intensity of pulmonary disease is no contra-indication to the operation ; and that there is no special danger to a consumptive in submission to tracheotomy. Finally, he describes severer operative procedures in the same disease, and reviews the current literature on the subject, and in this connection concludes that neither resection nor extirpation of the larynx has any prospect of success ; and that laryngotomy is often indicated either subsequently to the tracheotomy or in special tuberculous diseases of the larynx, as in cases of tuberculous tumors.

DR. HILDEBRANDT, of Hettstaedt (*Deut. med. Woch.*, March 28, 1889), pre-

fers inferior tracheotomy. He uses the bistoury solely for incising skin and trachea, and separates the intervening tissues chiefly by means of a special semicylindric hook to envelop the anterior wall of the trachea and draw the tissues down. Both appliances seem admirably adapted to their purpose; and we must refer to the original articles in which they are illustrated.

DERMATOLOGY.

UNDER THE CHARGE OF

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A CASE OF TUBERCULOUS TUMOR OF THE NASAL MUCOUS MEMBRANE.

DR. G. JUFFINGER reports (*Wien. klin. Woch.*, March 28, 1889) an interesting case of recurrent tuberculous tumor of the nasal mucous membrane, at Schrötter's clinic, in a female twenty-one years of age, twelve of whose brothers and sisters had died with pulmonary diseases, both parents remaining well. He recalls Schäffer's observation that in six instances of tuberculous tumors in his practice, all occurred in the subjects of hereditary tuberculosis.

The patient in question had groups of lupus nodules on the right cheek, on the neck, and under the chin. During the spring months the right nasal passage became gradually occluded, and the right half of the nose enlarged. In August, a tumor the size of a hazlenut was removed from the septum. A month later a recurrent tumor of the same size was removed with the incandescent snare. An approaching confinement prevented treatment of the base of the growth; and in October the patient returned with a fresh tumor in the nose. The tip of the nose was drawn to the left, and the right ala was much distended. The right nostril was occluded with a pale red tumor the size of a walnut; superficially ulcerated, with portions undergoing apparently caseous degeneration, and with yellow miliary nodules about its border. Miliary nodules were seen likewise upon non-ulcerated portions of the tumor. On probing the tumor it was found attached both to the septum and to the floor of the nose; but its actual dimensions could not be determined. It was not visible rhinoscopically. There were no glandular manifestations. There was infiltration of the apex of the right lung. There was no bleeding, pain, nor abnormal sensation. The only annoyance came from the occlusion in the nose and the consequent mouth-breathing. A portion of the tumor was removed with the electro-caustic snare; and after establishing an artificial furrow with the flat burner further portions were removed the size of hazlenuts.

A week later, the patient reported that the tumor had begun to protrude

externally since the evening previous; and it was seen to project about 1 cm. Without much force it was pulled downward, and suddenly broke off with slight hemorrhage. It was 4.5 cm. in length, more than 2 cm. in breadth, and about 1 cm. in thickness. The point of attachment was not more than 1 cm. at its broadest section. It extended from the floor of the nose along the border of the cartilaginous septum to the dorsum. The point of insertion was cauterized with the electric cautery, and this was followed by pencillings with 80 per cent. solution of lactic acid. After several weeks the greater portion was cicatrized, only an ulcerated, infiltrated point remaining on the floor of the nose. This was again destroyed with the incandescent cautery, and had healed up to a very small remnant.

A ROTATING CURETTE FOR SCRAPING AWAY LARYNGEAL GROWTHS.

At the Sixty-first Congress of German Naturalists and Physicians, DR. GOTTFRIED SCHEFF, regimental surgeon in Vienna, presented and described (*Wien. klin. Woch.*, March 28, 1889) a curette which, by means of a spiral stem and proper mechanism, could be rotated on its vertical axis by pressure of the thumb upon a rod enclosed in a tubular handle provided with two rings for the first and second fingers. It was devised and successfully used to eradicate a growth at the inferior surfaces of the vocal bands at the anterior commissure, and thus avoid an otherwise necessary division of the thyroid cartilage.

OBSTETRICS.

UNDER THE CHARGE OF

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THE CHARACTERISTICS OF A NORMAL PUERPERAL PERIOD.

TEMESVÁRY and BÄCKER (*Archiv für Gynäkologie*, Band 33, Heft 3) conclude from extensive observation on puerperal patients, that the temperature of the normal puerperal period does not differ from that of the healthy body under other circumstances; and that variations of temperature in the healthy puerperal state do not differ from the normal. The temperature of primiparæ is slightly higher than that of multiparæ.

The pulse of the healthy puerpera becomes gradually slower during the first eight days after labor, beginning immediately after delivery. The pulse is slow, full, and steadily diminishing in frequency. The slowing of the pulse is found twice as often in multiparæ as in primiparæ; it is caused by the condition of the blood, which receives after birth the products of the retrograde metamorphosis of the enlarged uterus; similar slowing of the pulse is observed in nephritis and after the crisis of croupous pneumonia.

Immediately after labor the uterus measured four and one-quarter inches

in length, four and one-third inches in breadth; during the succeeding twenty-four hours it increased three-quarters of an inch in length, and one-third of an inch in breadth; the daily diminution in size during the period of involution was one-third of an inch in length, and one-fifth of an inch in breadth; this involution was markedly lessened in women who did not nurse. Involution is more regular and speedy in multiparæ than in primiparæ; in general, the process has no influence on pulse, temperature, and respiration; occasionally very rapid involution, attended by rise of temperature, has been observed; a rise of temperature often hastens uterine involution.

Regarding lactation, it was found that mastitis was caused by septic infection; hyperæmia attending the establishment of the secretion of milk rarely caused high temperature. Women who did not nurse had a slightly higher temperature than those who nursed.

In general, a puerperal period in which the patient's temperature does not rise above 100° F.; in which uterine involution proceeds normally; in which the function of lactation is established without serious disturbance, and in which the general mental and physical condition of the patient is good, is to be regarded a normal puerperal period.

A SUCCESSFUL PORRO OPERATION FOR SEPTIC ENDOMETRITIS.

SUTUGIN (*Centralblatt für Gynäkologie*, No. 6, 1889) reports the case of a primipara, aged nineteen, admitted to the Moscow Maternity at term. The patient had symmetrically contracted pelvis (conjugata vera 2.34 inches) and was in labor; she had been repeatedly examined before admission by midwives, without antiseptic precautions, and was suffering from septic endometritis (fever and foul and discolored lochia). Porro's operation was performed because septic endometritis existed.

Upon operating, the membranes and decidua were of a dirty yellow color; the foetus was deeply asphyxiated, but was resuscitated. Hemorrhage was controlled by the elastic ligature about the cervix; this was retained after amputating the fundus, and the stump was transfixed by two long needles, seared with the thermo-cautery, dusted with iodoform and plaster-of-Paris, and dressed antiseptically; it was stitched into the lower angle of the abdominal wound, the serous covering of the cervix being brought into apposition with the peritoneum. Two mild eclamptic seizures followed the operation. The stump necrosed without infection (moist, odorless gangrene), and the patient made an excellent recovery.

The child became markedly icteric, and died on the fifth day; post-mortem examination revealed septicæmia without an appreciable focus of infection; death resulted from absorption of the products of the mother's endometritis.

A SECOND CÆSAREAN SECTION ON THE SAME PATIENT.

ZWEIFEL (*Centralblatt für Gynäkologie*, No. 13, 1889) reports a second Cæsaean section on a patient who had previously had this operation performed by him. During pregnancy, adhesion of the uterus and abdominal wall and intestines existed, with antelexion of the uterus and partial uterine hernia.

The second operation was made as soon as the os was dilated by vigorous

pains. But little dissection was required to open the abdomen; the mesentery and a loop of intestine were adherent to the uterus, the mesenteric and abdominal adhesions had produced the ante flexion. The uterus was opened by an incision extending over the fundus equally anteriorly and posteriorly, to avoid adhesions to the abdominal wall subsequently. The uterine muscle had been entirely restored at the site of the first incision; a chromic acid catgut suture was found in the muscle. Intermediate stitches were required in the uterine muscle, owing to the location of the incision; the stitches were made with catgut in oil of juniper.

As the patient had never borne a living child except by Cæsarean section, at her request and that of her husband, the Fallopian tubes were ligated with silkworm gut. Uninterrupted recovery followed; both the patient's children, borne by Cæsarean section, were in vigorous health.

EXTRA-UTERINE PREGNANCY, IN RUDIMENTARY UTERINE CORNUA.

HIMMELFARB (*Russian Journal of Obstetrics*, No. 4, 1888) has collected thirty-three cases of this anomaly; in twenty-four the uterus ruptured, with one death. In three cases a lithopædion formed. In seven laparotomy was done after the foetal death, with one maternal death.

COMPRESSION OF THE AORTA FOR POST-PARTUM HEMORRHAGE.

LA TORRE (*Nouvelles Archives d'Obstétrique et de Gynécologie*, No. 4, 1889) reports eight cases of post-partum hemorrhage successfully treated by compressing the aorta against the spine just above the fundus uteri. Immediately after labor a space exists between the fundus and intestines through which compression can readily be made.

POST-PARTUM HEMORRHAGE AFTER ECLAMPSIA.

VON RAMDOHR (*Medicinische Monatschrift*, New York, May, 1889) reports a case of eclampsia terminated by version and extraction in which severe hemorrhage persisted. Ergot, massage, hot and cold douches, and the introduction of the hand within the uterus failing to check it, the uterus was tamponed with 33 per cent. iodoform gauze in strips thirty-nine inches long; the vagina was tamponed with the same gauze, 20 per cent. The treatment was immediately successful. The tampons were removed forty-eight hours later, without septic infection.

SUBCUTANEOUS INJECTION OF SALINES FOR POST-PARTUM HEMORRHAGE.

PREGALDINO (*Bullet. de l'Acad. de Méd. de Belgique*, 1888, No. 9) has injected 6 per cent. salt solution into the subcutaneous abdominal tissue of dogs which had lost two-thirds of their blood; recovery followed. He also treated hemorrhage after abortion in the human subject in the same manner, using two pints of fluid; speedy recovery ensued.

MÜNCHMEYER (*Archiv für Gynäkologie*, Band 34, Heft 3) reports eight cases of severe post-partum hemorrhage successfully treated by this method. His

solution was 6.1 per cent. of sodium chloride, of which one quart was placed in a bottle, a cotton plug inserted, and the fluid sterilized.

For injection, a funnel, rubber tube thirty-nine inches long, and a long fine needle are needed, which are first carefully antisepticized. The injection is made deeply into the subcutaneous tissue, between the scapulæ, or in the supra-clavicular spaces; a quart may be used. The solution should be 98° F.; the fluid is rapidly absorbed if massage is made over the point of injection. Iodoform collodion is painted over the puncture; inflammation was not observed.

PUERPERAL HEMORRHAGE.

STUMPF (*Archiv für Gynäkologie*, Band 34, Heft 1) reports the case of a primipara, in whose family there was an indefinite history of hæmophilia, who had a normal labor followed by no hemorrhage. Nineteen days after, muscular exercise brought on hemorrhage, with an eruption of purpura, which persisted thirteen days, yielding only to the intra-uterine use of iron. The patient had excessive hemorrhage at the subsequent menstruation. Purpura is rare in women; a constitutional impairment of the vaso-motor centres was thought to cause this case.

CHLOROFORM FOR AFTER-PAINS.

LOVIOT (*Bulletins de la Société Obstétricale de Paris*, No. 4, 1889) reports a case of very obstinate after-pains, resisting opium, which yielded only to chloroform inhaled to the production of analgesia. The administration was continued for nine hours, seven ounces being used. No ill-effects followed.

THE VAGINAL TAMPON IN OBSTETRIC PRACTICE.

GREENE (*Boston Medical and Surgical Journal*, No. 18, 1889) has used to great advantage the cotton-glycerine tampon, so commonly used by gynecologists, in arresting abortion by supporting the uterus; in checking post-partum hemorrhage; in supporting an irritable uterus after repeated abortion, prolonging gestation to the normal limit and also preventing subinvolution after delivery; and in checking excessive nausea by supporting the uterus in a neurasthenic pregnant patient. He considers it a resource of decided value.

DISINFECTION OF THE GENITAL TRACT; AN EXPERIMENTAL AND CLINICAL STUDY.

DÖDERLEIN (*Archiv für Gynäkologie*, Band 34, Heft 1) concludes, from experiment, that a single irrigation of the vagina with bichloride of mercury or carbolic acid is not effectual for disinfection; vaseline, when applied to the vagina, prevents the action of the disinfectant on the mucous membrane; if an efficient disinfection be done, the mucous membrane is dried and roughened.

Creolin (2 per cent. solution) does not injure the mucous membrane. The

use of mollin (an excessively fatty soap) and creolin is unirritating and efficient.

GÜNTHER has made clinical tests of Döderlein's conclusions, by the following method: one quart of an emulsion of creolin (three per cent.) and mollin is injected into the vagina before labor; the labia are held together, and the injection is retained as long as possible; no further disinfection internally is needed. His cases show seventy per cent. of normal puerperal periods; there was no mortality.

TWO HUNDRED LABORS WITHOUT A PROPHYLACTIC DOUCHE.

MERMANN (*Centralblatt für Gynäkologie*, No. 16, 1889) considers vaginal douches in the hands of the average midwife dangerous. He does not believe in auto-infection. As a clinical test he conducted two hundred labors in the Manheim Maternity without prophylactic vaginal douches, but with the most scrupulous antisepsis of building, nurses, students, and attendants; the patients were carefully disinfected externally. The labors were at term, the placenta was expressed by Credé's method fifteen minutes after birth.

There were two deaths, one from infection contracted outside of the clinic, and one from cancer of the stomach. In the first hundred cases twenty-one per cent. had rise of temperature; in the second hundred, six per cent. The difference arose from an improvement in discipline of attendants regarding personal antiseptic precautions.

In the *Centralblatt*, No. 20, 1889, DÖDERLEIN replies to Mermann, stating that the obstetrician must disinfect his field of operation just as the surgeon does. Pathogenic germs are found in the genital tract of women who have never been treated by doctors and nurses; they may remain from previous infection (specific or other), or may have come from an unknown source. Cleansing the vagina by thorough anointing with mollin and creolin and a prophylactic douche of creolin he considers the best routine practice for disinfection.

THE INFECTION OF PUERPERAL WOUNDS.

BUMM (*Archiv für Gynäkologie*, Band 34, Heft 3), from an extended study of puerperal infection, concludes that practically the theory of auto-infection, and the effort to destroy germs in the genital tract of all patients does not result as well as the belief that infection comes from without, and the practice of disinfecting the external genitals of the patient only, and all which touches her. The effort to sterilize the genital tract of all patients is unnecessary, often dangerous.

From the study of 2308 births at Hanover, POTEN (*Ibid.*) concludes that external disinfection, with a single vaginal douche before labor, gives best results. Under this method 78.8 per cent. of his cases had no rise of temperature.

NON-SEPTIC PULMONARY DISORDERS IN THE PUERPERAL STATE.

PHILLIPS (*Obstetrical Society of London*, May 1, 1889) reported eight cases of pulmonary disorders in the puerperal state; four developed dulness rapidly, had no fine crepitation, and were accompanied by phlegmasia. In the others

labor seemed to excite a preëxisting pulmonary lesion. He did not accept the septic and embolic theories.

In discussion BARNES believed septic thrombosis a frequent cause of these cases, arising in the patient's failure to excrete the products of retrograde metamorphosis during involution, the puerperal blood being full of fibrin and likely to form thrombi.

HÆMATOMA OF THE VULVA DURING PREGNANCY.

EHRENDORFER (*Archiv für Gynäk.*, Bd. 34, Heft 1) reports a case in which hæmatoma of the vulva followed coition. The patient was five months pregnant, and the congestion of the genital organs caused by pregnancy favored the formation of the hæmatoma. Incision, evacuation under antiseptic precautions, and tamponing with iodoform gauze effected speedy cure.

IMPACTED RETROVERSION OF THE PREGNANT UTERUS.

O'DONOVAN (*Maryland Medical Journal*, May 18, 1889) reports a case of impacted and retroverted pregnant uterus, between three and four months. The bladder was enormously distended, micturition being impossible. Catheterization and warm enemata resulted in spontaneous ascension of the uterus; manual efforts had failed.

CHRONIC INVERSION OF THE UTERUS; REPLACEMENT; RECOVERY.

NEWMAN (*Obstetrical Society of London*, May 1, 1889) reported a case of inversion of the uterus of sixteen months' standing; replacement was effected by Aveling's repositor, pressure varying from two to three pounds, at intervals, for eighteen days.

To secure a firm point for pressure a belt of adhesive plaster was fitted just below the iliac crests, and loops of tape gave attachment to the elastic bands of the repositor. Recovery was uncomplicated.

SLOUGHING OF THE FUNDUS UTERI, WITH PERFORATION, OCCURRING DURING SEPTICÆMIA.

CULLINGWORTH (*Transactions London Obstetrical Society*, vol. xxx. p. 406) reports a case of gonorrhœal hydrosalpinx, in which septicæmia and death followed operation. Post-mortem examination revealed a slough at the upper border of the fundus opening into the peritoneal cavity at the junction of the right tube. Suppurative peritonitis existed.

[In a case of syphilitic placentitis, with death of the fœtus and maternal sepsis, the Reporter recently was summoned in consultation because of an adherent placenta. Manual removal of the placenta resulted in leaving a portion adherent at the fundus uteri. High temperature following, on the next day the attending physician curetted the uterus with a wire-loop curette, removing a piece of decomposed placenta; immediate and decided fall of temperature followed. Septic peritonitis and death ensued.

Post-mortem examination revealed a slough at the fundus uteri where the placenta had been adherent; the peritoneal cavity had probably been entered by the curette at this point; the fundus uteri lay in an encapsulated perito-

neal abscess. Intra-uterine injections had been given, but the fluid returned promptly.—ED.]

AN INTERESTING CASE OF THE SURVIVAL OF A PREMATURE FŒTUS.

GILBERT (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band 16, Heft 1) reports the case of a female child, born in the twenty-ninth week of gestation, weighing three and a half pounds; the child was twenty-two inches long when five and a half months old. Various incubators were tried, but daily warm baths were most successful. The child was taken into the open air from the moment of birth. For the first week a wet-nurse fed the infant; afterward the mother. From the seventeenth day it was fed breast-milk with a spoon. When eighteen weeks old cow's milk was given.

In growth the greatest gain occurred at the time when birth would have normally occurred. The child suffered from frequent attacks of syncope until its fourth year; it had also spinal curvature (scoliosis 35°) from rachitis, this was afterward reduced by orthopædic treatment (to 5°). The milk teeth were complete at three and a half years.

THE STERILIZATION OF MILK FOR CHILDREN ON A LARGE SCALE.

So important is the sterilization of milk for children regarded that the Emperor of Austria and Bohemia has established apparatus on a large scale for gratuitous preparation of milk for the children of the poor.

It consists (*Prager medicinische Wochenschrift*, No. 14, 1889) of a reservoir for water communicating with a spiral or worm, into which steam passes. A sterilizing chamber above the spiral is heated by the spiral, and may also be filled with steam from this source; in this chamber are tiers of racks containing the milk in bottles. An amount sufficient for a considerable number of children can thus be sterilized at once.

THE CONTAGION OF SCARLATINA AND DIPHTHERIA.

SEVESTRE (*Gazette Hebdomadaire*, No. 9, 1889) considers scarlatina contagious before eruption by expired air; the contagion operates at short distances only, and is of brief vitality. The contagion of diphtheria is persistent, having been known to endure two years; it is easily transmitted and difficult to destroy; isolation is of little value, rigid antisepsis is necessary.

GRANCHER considered dried sputa floating in the air the infective agent in scarlatina; when numbers of patients are isolated in company, pneumonia is often observed to develop more frequently than in cases not thus isolated.

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CORROSIVE SUBLIMATE AND CREOLIN IN OBSTETRIC
PRACTICE.

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I. CORROSIVE SUBLIMATE.

ANTISEPTIC midwifery is no longer *sub judice*. Its results are such that the accoucheur who confines a woman without antiseptic precautions exposes her life to an unnecessary risk. When, about the year 1870, carbolic acid was introduced, the diminution in mortality was striking, and when, in 1883, corrosive sublimate was extensively used, the results obtained were simply phenomenal.

Only to speak of the institution in which I introduced it on the 1st of October, 1883, in Maternity Hospital the average mortality for the preceding nine years had been 4.17 per cent.; during the last six months before the change it was 8 per cent.; during the last month it was even 20 per cent., and in nearly 16 per cent. the cause of death was sepsis. Now let us see the difference in the mortality since then. During the first three months we had one hundred and two deliveries without a single death. From that time until the hour of writing the mortality has been as seen by the following table.

Thus, *the total mortality has become less than one-fourth of what it used to be*, and while in former years the cause of death was nearly always some form of disease which we now regard as due to infection, *deaths from sepsis have now been reduced to one-fourth of one per cent.* During several years there has not occurred a single death from septic diseases.

YEAR.	Deliveries.	DEATHS.		PER CENT.	
		Total.	From sepsis.	Total mortality.	Sepsis.
1884	522	8	4	1.53	0.76
1885	537	3	0	0.56	0.0
1886	446	5	1	1.12	0.22
1887	389	5	1	1.30	0.26
1888	377	3	0	0.80	0.0
Total,	2371	24	6	1.01	0.25

The only question nowadays is, Which antiseptic drug, or drugs, shall we use, and especially, is it safe to use bichloride of mercury?

When, two years ago, I published my *Practical Guide in Antiseptic Midwifery in Hospitals and Private Practice*, I expressed myself unhesitatingly in favor of the use of the bichloride. At that time only five deaths were known to have been caused by the use of this drug, and they had all occurred under an exaggerated or careless use of it. But since then the number of deaths has increased rapidly, and some of them have occurred under circumstances which do not leave much room for criticism. I have, therefore, found it necessary to go over the whole ground again and examine every single case that has been reported as having ended fatally on account of poisoning with the potent drug. The reports of cases in which there appeared more or less severe symptoms of poisoning, but which ended in recovery, are so numerous that it would lead me much too far to consider them here. I leave likewise out of consideration the numerous deaths which have occurred in gynecological and general surgical practice, limiting this paper exclusively to the consideration of the fatal cases in obstetric practice.

So far as I have been able to find, by means of the *Index Medicus* and similar works, the cases that have occurred in obstetric practice number twenty, to which I add two new ones.

FATAL CASES OF CORROSIVE SUBLIMATE POISONING IN OBSTETRIC PRACTICE.

A. Abstracts of Published Reports.

A. Cases in which death was undoubtedly due to the poisoning.

CASE I.—Stadfeldt (*Centralblatt für Gynäkologie*, 1884, vol. viii. p. 97, and Supplement by Dahl, *ibid.* p. 195). Healthy primipara. Easy delivery of child. Retention of placenta causing hemorrhage (800 grammes, about 27 ounces, were collected). The partially adherent placenta was peeled off and removed. Uterus and vagina were irrigated with a 3 per cent. solution of carbolic acid. The anæmia was not considerable. On the fifth day a chill and temperature 103.3° F. Intra-uterine injection with corrosive sublimate (1:1500). Quantity not stated. During the injection the patient complained of headache, choking and pains in the hypogastric region irradiating to the

groins and the back. She fell into a profuse perspiration, felt tired and dizzy. Diarrhœa containing a little blood. The urine contained much albumin; later it was nearly suppressed. Vomiting; ulcerations under the tongue; no salivation; thirst; sensation of heat, although the temperature was sub-normal. The face became cyanotic, the pupils contracted, the eyes glassy, the pulse weak and irregular; delirium. Death ten days after delivery and five days after the injection.

The autopsy revealed numerous ulcers on the mucous membrane of the large intestine covered with a yellowish-gray layer that could be scraped off. The cortical substance of the kidneys was much swollen; the epithelial cells contained fat drops, and the ducts contained hyaline casts and amorphous masses of carbonate of lime; the cerebrum was dry; the placental site was covered with a reddish-gray layer.

CASE II.—Lomer (*Zeitsch. für Geburtshülfe und Gynäk.*, 1884, vol. x. p. 351). A rupture of the perineum extending into the rectum was stitched up under irrigation with a solution of corrosive sublimate 1:1000. Extremely stinking diarrhœa, moderate fever; death on the twelfth day after confinement.

Autopsy: necrosis of the mucous membrane of the whole large intestine, moderate inflammation extending up into the small intestine.

CASE III.—Winter (*Centralbl. f. Gynäk.*, 1884, vol. viii. p. 443). Primipara; eclampsia; forceps; post-partum hemorrhage; anæmia. Hot intra-uterine douche of 4 or 5 litres (quarts) of a 1:1000 solution of corrosive sublimate, and irrigation of perineum, during stitching, with 1 or 1½ litre more. During the following night abdominal pain, tenesmi, profuse stinking diarrhœa; bluish line on gums and gangrenous patches on the mucous membrane of the mouth; low temperature; hyperæsthesia of the skin. The patient took little interest in what happened around her and was almost sleepless. The urine was scant, contained much more albumin than before delivery, blood and cells. The microscopical examination of the blood showed great increase of colorless blood-corpuscles. On the third day collapse and death.

The autopsy revealed swelling of the whole large intestine, especially of the mucous membrane, ecchymosis and greenish-gray color of the same. The inside of the uterus and cervix had the same discoloration.

CASE IV.—J. C. Vöhtz (*Centralbl. für Gynäk.*, 1884, vol. viii. p. 493). Multipara, æt. thirty-three; not menstruated for three months; uterine hemorrhage; manual removal of ovum; injection of about 6 ounces of a solution of corrosive sublimate (1:750). During the injection violent pain in lower part of abdomen. Later vomiting, mucous and bloody diarrhœa, with tenesmi, salivation, patches on gums, congestion to head, anuria for four days, followed by secretion of small amount of highly albuminous urine; itching. Large ulcerations could be felt in the rectum. Somnolence and death ten days after delivery. No autopsy.

CASE V.—E. Partridge (*Amer. Journ. of Obstetrics*, 1885, vol. xviii. p. 405). The case occurred at the Nursery and Child's Hospital. Vaginal injections of bichloride of mercury, 1:2000, were used. Patient did well for three days. On the third day she had a chill, and the house surgeon gave an intra-uterine injection of the same solution. The next day there was another chill, and the injection was repeated. This was followed by bloody passages from the bowels, and death within sixty hours from first intra-uterine douche.

The post-mortem showed intense colitis.

CASE VI.—W. Netzel (*Centralbl. f. Gynäk.*, 1886, vol. x. p. 440). Primipara; normal delivery. During the first seven days twice daily vaginal injections with a solution of corrosive sublimate 1:3000. On the seventh day fever. Two intra-uterine injections (1:1500) were given. During the first, slight abdominal pain and insignificant bleeding. During the following night signs of poisoning appeared—bloody diarrhœa, vomiting, headache, somnolency and stomatitis. The secretion of urine much diminished; it contained mercury, albumin, epithelial cells, granulation cells, and granular casts. The patient remained conscious, but became more and more prostrated, and died twenty-two days after delivery and fourteen days after the intra-uterine injection.

The autopsy revealed contraction of the œsophagus with injection of its mucous membrane, ulcerations of the whole colon, parenchymatous nephritis with calcareous deposits in the convoluted and straight tubules. In the uterus a fibrinous deposit was found on the placental site.

CASE VII.—Carl Fleischmann, assistant to Breisky (*Centralbl. f. Gynäk.*, 1886, vol. x. p. 761). Primipara, æt. seventeen, robust and healthy; no œdema. Before and after an examination a vaginal douche of at most 2 litres of a solution of corrosive sublimate (1:2000). *Before the examination there was already a slight discharge of bloody mucus from the genitals* After the examination, whether before or after the administration of the second douche could not be ascertained, she was seized with pain in the lower part of the abdomen, followed by vomiting and diarrhœa. In the afternoon the temperature rose to 101.3° Fahr. Bloody mucus was removed from the vagina by means of a three per cent. solution of carbolic acid. The following day she gave birth to a living child. After the removal of the placenta a vaginal douche of a four per cent. solution of carbolic acid was given, and a small rupture of the perineum stitched up with catgut. She was well until the next day. Then began signs of poisoning—stinking and bloody diarrhœa, salivation, swollen and purple gums, diphtheritic patches on the much swollen tongue, on the red tonsils, uvula, and palatal arches, and on the posterior wall of the pharynx; carrion-like stench from the mouth. Urinary secretion diminished to twenty cubic centimetres (about 3v.) in twenty-four hours, or altogether suppressed. The urine turbid, contained much albumin, numerous hyaline and granular casts, epithelial cells from the kidneys and the bladder, leucocytes, and a few red blood-corpuscles. Stertorous respiration; twitchings of the upper extremities; somnolency, coma, and death seven days after delivery, eight days after the injection with corrosive sublimate.

At the post-mortem were found the above-mentioned diphtheritic ulcerations of the buccal cavity, signs of fresh pleurisy and pneumonia. Heart and liver looked as if boiled. The kidneys were the seat of nephritis with extensive loss of epithelium, deposit of amorphous calcareous masses, and hyaline and granular casts. At the ileo-cæcal valve and in the ascending colon the mucous membrane was swollen, covered with a yellowish-gray layer, and sloughy. In the remainder of the large intestine only a few folds of the mucous membrane were found dark red.

CASE VIII.—Berthod (*Centralbl. f. Gynäk.*, 1887, vol. xi. p. 768). Primipara; normal delivery; laceration of cervix; bruising of vagina and perineum. Vaginal douche with corrosive sublimate (1:1000) at the beginning of labor; an intra-uterine injection with the same after the birth of the child. The following day three vaginal injections with the same. *In spite of two diarrhœic discharges three more vaginal injections were given during the night and the following morning.* Stomatitis, frequent bloody and stinking diarrhœa. Then the bichloride was discontinued, and replaced by a three per cent. solution of boracic acid. Ulceration of the mucous membrane of the mouth and gums; œdema; albuminuria. Death on the ninth day after delivery.

Autopsy: ecchymoses and ulcers in colon and rectum; nephritis.

CASE IX.—Steffeck, assistant of Hofmeier (*Centralbl. f. Gynäk.*, 1888, vol. xii. p. 65). Multipara, æt. twenty-seven; fifth month of pregnancy. Hemorrhage; labor pains; cervix open. The genitals washed with corrosive sublimate (1:1000); vaginal injection of one litre of a 1:3000 solution. The following three days a similar vaginal injection once a day. On the fifth day expulsion of a macerated fœtus four to five months old; placenta left behind. Hemorrhage checked by injecting a litre of a 1:3000 solution into the uterus. Tampon of iodoform gauze. On the sixth day a similar vaginal injection. In the evening chill; temperature 102.7° Fahr. First then the placenta was removed after giving a vaginal injection of a litre of 1:3000, and an intra-uterine of a litre of 1:5000. After the removal the hemorrhage was checked by giving another intra-uterine injection of a litre of 1:5000.

[Thus this poor patient had for a simple case of abortion had five vaginal (1:3000) and three intra-uterine (1:5000) injections, each of a litre. If the placenta had been removed immediately with a large, dull wire curette, and one intra-uterine injection given, she would in all likelihood have been out of all danger.]

An hour after the last injection tenesmus and diarrhœa, and, at the same time, chill and a temperature of 105.8° Fahr. From the seventh to the thirteenth day, on which she died, there were pain in the mouth, foul breath, diphtheritic patches on gums and cheeks, a dry, black tongue, eructation, vomiting, frequent bloody diarrhœa; anuria or secretion of a very small quantity of dirty urine containing albumin, mercury, granular casts, vesical epithelium, and pus-corpuscles; dizziness, headache, clonic contraction of the fingers and forearms, itching of the skin, loss of consciousness, and coma.

The autopsy revealed nephritis with fatty degeneration of the epithelium; calcareous deposits; dirty greenish infiltration or necrotic patches in the lower part of the small intestine and most of the large, especially the rectum.

CASE X.—Schwarz, reported by W. Thorn (Volkmann's *Klinische Vorträge*, 1885, No. 250, p. 15). Decrepit pluripara, delivered in the sixth month of a three months' fœtus. After the removal (*Ausraümung*) the uterus was washed out with a litre of a 1:1000 solution of corrosive sublimate. Similar injection on the next day. "Evident symptoms of corrosive sublimate poisoning, from which she died on the ninth day."

CASE XI.—W. Thorn (Volkmann's *Klinische Vorträge*, 1885, No. 250, p. 15). Healthy primipara, æt. twenty-six. Forceps delivery for flat pelvis. Vaginal injection with a 1:1000 solution of corrosive sublimate, quantity not mentioned. Two hours after delivery profuse diarrhœa; pulse weak, 120 per minute; thirst, no rise in temperature, mind clear. From the next day frequent vomiting, tympanites, colic, incontinence of bowels, delirium. The diarrhœa contained a little blood. Tongue dry; somnolency. Death on the tenth day.

The autopsy revealed peritonitis with exudation and adhesions. In the large intestine were found numerous ulcers with gray bottom and edges on the dark mucous membrane. Parenchymatous nephritis.

CASE XII.—Dolérís (*Nouvelles Archives d'Obstétrique et de Gynécologie*, 1886, p. 200). Primipara, æt. twenty-four. Forceps delivery, causing deep laceration of the vagina and of the perineum. Intra-uterine and vaginal injections of a 1:1000 solution, quantity not mentioned. The third day diarrhœa began and continued all the time; prostration, nausea, involuntary evacuations from bowels and bladder; coated, dry tongue. *The injections were continued "very regularly" every day (how many times?) until the death of the patient on the seventh day after delivery.*

[This case was treated in November, 1884, when yet nobody suspected the possibility of poisoning from the injections. Dolérís has great merit in elucidating this point.]

The autopsy showed the mucous membrane of the colon and rectum to be swollen, dark gray, and the seat of extensive ulceration. A similar condition was found in the small intestine, near the ileo-cæcal valve.

CASE XIII.—William Levy and Virchow (*Berl. klin. Wochenschr.*, 1888, vol. xxv. p. 72). Healthy pluripara, æt. twenty-four. Expulsion of a putrid fœtus in the fourth month of gestation. The external genitals were bathed with a 1:1500 solution of corrosive sublimate. The vagina was syringed with half a litre of the same fluid, and one litre was injected into the cavity of the uterus. Then the placenta was removed under anæsthesia. After its removal intra-uterine injection of half a litre of a 1:5000 solution of corrosive sublimate, and vaginal injection of the same amount and of the same strength. All fluid was carefully removed from the uterus and the vagina by pressure on the fundus and the perineum.

As soon as the patient came out of the anæsthetic condition she had a chill, dyspnoea, and weak pulse. Two hours later, diarrhœa, which became profuse the next day. Vomiting, anuria, subnormal temperature (94.1° to 95.9° F.). Collapse. Death on the sixth day after delivery.

Autopsy: severe hemorrhagic and diphtheritic inflammation of the whole intestine, large and small. Parenchymatous nephritis without calcareous deposits.

CASE XIV.—Virchow (*Berliner klinische Wochenschrift*, 1888, xxv. p. 72). Patient, æt. twenty one. Delivered three weeks before; eight days after delivery intra-uterine injections of two litres of 1:4000 solution of corrosive sublimate. Profuse hemorrhages from the intestine.

The autopsy showed "no colitis worth speaking of," but in the ilium several places that were much swollen, with hemorrhagic infiltration of the wall and free blood in the interior of the bowel. Extensive deposits of phosphate of lime in the circumvolute tubules of the kidneys and the capsules of the Malpighian tufts.

CASE XV.—G. Braun (*Wiener med. Wochenschrift*, 1886, vol. xxxvi. p. 751). Primipara, æt. twenty-one. During the first stage a vaginal injection, and after delivery an intra-uterine injection of 2 litres of a 1:1000 solution of corrosive sublimate were given. Two days later pain in lips, considerable swelling of the mucous membrane of the mouth, with diphtheritic patches; profuse diarrhœa; slight salivation; foul breath. Collapse and death on the sixth day.

The autopsy showed necrosis of the mucous membrane of the ilium, and large intestine; kidneys swollen.

CASE XVI.—Dakin (*Trans. Obstet. Soc. of London*, 1887, vol. xxviii. p. 290). They use vaginal douche of corrosive sublimate 1:2000, 2 quarts before and after delivery. The ante-partum douche is repeated if the first stage be abnormally long. After delivery the patient is for the first two days douched twice a day with nearly 3 pints of 1:2000; after the first two days, usually twelve days with 1:4000.

Tripara, æt. twenty-eight. Perineum intact; cervix not deeply torn; always in good health; urine normal up to the fifth day. On the sixth day she had slight abdominal pain, diarrhœa, which continued the following days, and passed six or seven ounces of blood-stained mucus from the vagina; vomiting. On the eighth day foul breath. On the ninth tender gums, swollen and sore tongue, salivation, and loose teeth. On the eleventh swelling of the parotid region. On the fourteenth day hemorrhage from the mouth. Tongue gray and dry; pulse rather jerky; temperature subnormal. On the fifteenth day drowsiness. On the sixteenth stertorous respiration; pupils not contracted. Quite conscious before her death, which occurred the same day.

The autopsy revealed abnormal adhesion of the dura mater to the calvarium and pia mater, and a recent blood-clot the size of a five-shilling piece and one-quarter of an inch thick in the arachnoid space. Source of hemorrhage not found. Vessels and brain healthy; ulcerations in the tonsils. In the large intestine the summits of the folds were intensely congested, black, and in places sloughing. Peritoneum healthy but for two firm, recent adhesions, one the size of a crown-piece on the right margin of the liver, and the other attaching the upper end of the spleen to the cardiac end of the stomach. Kidneys pale, with a few red Malpighian bodies and congested veins. Microscopical examination revealed acute and chronic parenchymatous nephritis; no calcareous deposits.

b. Cases of undoubted poisoning, but with so considerable an element of sepsis that it cannot be proved that death was due to the poisoning.

CASE XVII.—(*New Orleans Med. Journ.*, 1888, vol. xv. p. 861). Abortion at two and a half to three months' gestation. Fœtus showed some indications of putrefaction. Intense hemorrhage. The adherent placenta was removed mechanically. Before delivery the patient had had fever for several days with a slight rigor occasionally. On the day after delivery she had a very severe one, followed by high temperature, the rigors increasing every day in

frequency and intensity. With the first rigor intra-uterine sublimate injections of 1:1000 were given *from two to six times daily*. After the second or third injection there formed upon the uterine neck, the vaginal walls, as well as the walls of both anterior and posterior cul-de-sacs, a white and thick diphtheritic membrane, which entirely obscured from view the meatus urinaris, through which a catheter could be introduced only by force. The vaginal walls became tightly contracted and formed great folds, making it an impossibility to introduce the finger without causing great pain. The use of the corrosive sublimate was deferred sufficiently long for the diphtheritic membrane to become detached and be expelled. During this time the rigors increased in frequency and severity. Some time before death the mouth and gums were badly swollen, dark red, and spongy. The entire zygomatic surface became enormously enlarged. The liver became enlarged and solidified [?], the lungs inflamed, with a terrible cough, and the expectoration of large pieces of dark lung tissue [?], and peritonitis. *The diphtheritic membrane reappeared invariably upon resuming the sublimate treatment.* The patient had terrible pytalism. The injections invariably produced the most intense pain. No autopsy seems to have been made.

CASE XVIII.—G. Braun (*Wiener med. Wochenschr.*, 1886, vol. xxxvi. p. 786). Primipara, æt. twenty-three. On the fourth day high temperature (103.3° F.); still higher the next day (105.8°); fetid lochia. An intra-uterine injection with 1:3000 corrosive sublimate was given (quantity not stated, but commonly 1½ litre). The following six days, morning and evening, a vaginal douche of the same strength was given, and each time followed by an injection of distilled water.

On the ninth day diarrhœa began. Chemical examination of the feces revealed a large quantity of mercury yet thirteen days after the discontinuation of the bichloride, and traces until the death of the patient, thirty days after delivery.

The autopsy showed, beside signs of septic inflammations, swelling and redness of the mucous membrane of the pharynx and stomach and hemorrhagic infiltration of some of the folds in the intestines. The kidneys were swollen, the cortical substance pale.

CASE XIX.—Virchow (*Deutsche med. Wochenschr.*, 1887, vol. xiii. p. 1047). Primipara, æt. twenty-five, had been treated with carbolic acid before admission to the hospital. Here she had intra-uterine douches with a litre of a 1:1000 solution of corrosive sublimate on three consecutive days. She died on the fourth day.

At the autopsy were found diphtheritic patches in the vagina and uterus; parametritis; purulent peritonitis; empyema; multiple purulent arthritis; and very grave diphtheria of the colon. Chemical analysis proved the presence of mercury in the intestine.

[Here are so pronounced signs of septic localization that it is very doubtful if death was attributable to the use of the bichloride.]

CASE XX.—Virchow (*Ibid.*). A puerpera had been treated with corrosive sublimate before entering the hospital; quantity unknown.

At the autopsy the vagina and uterus were found in pretty good condition, but "affection of the endocardium, the kidney, and the liver, and especially a very severe affection of the colon."

[Since we do not have any information about the symptoms, and the post-mortem find is only indicated in such a general way, it is impossible to see if death was due to corrosive sublimate.]

B. Unpublished Cases.

CASE XXI.—On October 7, 1888, I was called in consultation to see Mrs. M., æt. thirty-five, primipara, at or near full term. On October

2d, labor being slow, her physician had dilated the cervix manually and extracted the child by high forceps operation at 2 P. M.

Previously all outer parts were disinfected with a 1 : 2000 solution of bichloride of mercury ; no vaginal injection. On accomplishment of labor a gallon of a hot solution of bichloride, 1 : 4000, and one ounce of carbolic acid was prepared. With some of this the vagina was syringed out and the tube pressed into the uterus. After a very few moments the patient complained of suffering, and slowly passed into a condition of *syncope*, followed by clonic *spasmodic muscular action*. Seeing the patient lose consciousness the doctor withdrew the tube when less than one-half of the fluid had been used. She recovered at once and apparently felt well ; she passed, however, no urine, and when the catheter was introduced in the evening only a teaspoonful of a grumous dark urine was obtained. The same scant secretion of a dark grumous urine continued till the end, the patient only once passing an ounce voluntarily.

On the second day the temperature was $101\frac{1}{2}^{\circ}$ F., and on the third 102.8° F., accompanied by a pulse ranging from 116 to 130, and changing at short intervals.

On the third day the patient had *four or five quite offensive movements of the bowels*, and during the remainder of her illness the bowels continued irritable, but the movements were not too frequent, nor bloody or dysenteric.

On the same day the patient complained of sore mouth, and marked mercurial *stomatitis* was discovered—the gums were soft and pulpy, the tongue loaded, the teeth sore to the touch ; there were abrasions of the epithelium and salivation. Chlorate of potash was given as a gargle and one grain internally every hour.

On the fourth day the patient was taken out of bed by her friends and stood upon the floor while the bed was being made. After that the abdomen became swollen and tender. To combat the peritonitis morphine, one-sixth of a grain, was given every two hours and later every four hours. Stimulants were given freely and an icebag placed on the abdomen. She became drowsy, but was easily awakened and her intellect was clear. She was assuming a waxy *pallor* with some slight *puffiness* of the face and the extremities. Temperature 101.5° F. ; pulse 135.

On the sixth day the pallor of the entire surface was intense, extending to the mucous membrane of the mouth. The puffiness was so marked as to produce glossiness of the surface. The patient lost consciousness gradually, passed into a condition of coma, and died at 11 A. M.

No autopsy.

[It is not possible to decide whether the peritonitis was due to infection during delivery, exposure, or poisoning, but the other symptoms suffice abundantly for the diagnosis of the last.]

CASE XXII.—(Record book of Charity Hospital.) M. D., secundipara, æt. 28, had *diarrhœa for a few days before delivery*. Rather tedious but otherwise normal labor July 22, 1884. Placenta spontaneously expelled upon delivery of the child. She had had our usual treatment, including washing of the skin and vaginal injections of a quart of a 1 : 2000 solution of bichloride of mercury. How many cannot be

ascertained, but since the first stage lasted twenty-five hours it is probable that she has had about eight. None after delivery.

First day. During the night and early morning, while in labor, she had ten large, loose movements. From 7.15 A. M. till 6.30 P. M., eight large, watery movements of the bowels. From 7 P. M. till midnight six watery movements.

Second day. From midnight till 7 A. M. one small movement; from 7 A. M. till 2.20 P. M., four watery movements. During the evening three movements.

Third day. 1 A. M., two movements; from 6 A. M. till 12 M., three loose movements; from noon till 6 P. M., five movements; at 8.40 P. M. one small movement with blood.

Fourth day. From 5 A. M. till 1 P. M., five movements. At 3.30 P. M., one large movement. At 5.15 P. M., one small movement. In all, *forty-nine movements of the bowels in four days.* She vomited several times a day and suffered from retching.

The urine taken with catheter on the third day did not contain albumin. The temperature was more or less elevated and reached even 103.8° on the second day. On the fourth day she became delirious and picked at the bedclothes.

She was treated with opiates, cold-water enemas, starch and laudanum enemas, bismuth, Fowler's solution, ipecacuanha, tr. iodinii, sodium bicarbonate, once sulphate of magnesia, quinine, brandy, peptonized milk, and turpentine stupes.

[Although the rise in temperature, the negative examination of the urine, and absence of stomatitis are unusual, the enormous discharge from the bowels, at last becoming bloody, make it at least highly probable that the preëxisting diarrhœa was made worse, and led to a fatal issue by supervening absorption of corrosive sublimate. It will be noticed that not once is the presence of pellicles in the stools mentioned.]

Thus, by a diligent investigation, I have been able to find twenty-two cases which ended fatally.

Of these, three (XVII., XVIII., XIX.) must be left out, because the septic element present was so great that it is very doubtful if their death can be attributed to the effects of the bichloride. We must likewise eliminate Case XX., on account of the insufficient information given in regard to symptoms and autopsy.

In the majority of the fatal cases a too strong solution was used: in one case (V.) 1:2000, in three cases (I., VI., XIII.) 1:1500, in eight cases (II., III., VIII., X., XI., XII., XV., XVII.) 1:1000, and in one case (IV.) even 1:750.

The experiments of Koch have shown that the anthrax bacillus, the most resistant of all, is killed by immersion for a few minutes in a solution of bichloride of mercury 1:1000, and he thinks that in most cases a single application of a 1:5000 solution will suffice.¹

¹ Richard Koch, Mittheilungen aus dem Kaiserlichen Gesundheitsamte, 1881, vol. i. p. 277.

In obstetrics we have not to deal with so resistant bacteria. A solution of 1:5000 would, therefore, probably yield us all the antiseptic action needed and expose our patients to much smaller danger than when stronger solutions are used.

Frequently, too large a quantity of fluid was used, even up to six or seven litres of a 1:1000 solution (III.). It is evident that the greater the amount used, the greater is the danger of absorption of a fatal dose. In most of the cases no mention is made of the fluid having been removed from the uterus and the vagina. If that is not done, a considerable quantity may remain in the uterine cavity, the inside of which presents one large raw surface, and whose placental site is full of recently closed large venous sinuses, or in the vagina, where it perhaps bathes a torn cervix, and at all events stays in contact with numerous small tears and abrasions of the vaginal walls, or slowly trickles down over similar places in the vulva.

The experiments of Butte and Doléris¹ have shown how fatal the effect of a solution of bichloride of mercury is when it is kept in contact with a wound leading into the subcutaneous connective tissue, and the same applies, of course, to the submucous. Even the intact mucous membrane of the vagina absorbs the solution, as proved by these same experiments and by the clinical observations of von Herff, G. Braun, and others.²

At the end of an intra-uterine injection the uterus ought always to be carefully squeezed until all fluid is expelled. I even squeeze it out many times during the injection, in order to prevent too great a pressure and entrance into veins or tubes. From the vagina it may be expelled by pressing down the perineum, but this would expose it to too great a tension, if newly stitched; cause pain, and might even become a source of infection. I have found that the mere turning of the patient on her side is sufficient to make nearly all fluid run out of the vagina.

Returning to the above-mentioned fatal cases, we find, furthermore, that not only vaginal (V., VI., XVI.), but even intra-uterine (VIII.), injections were given after the birth of the child, in cases of normal delivery, in which they are uncalled-for. In my very first publication on antiseptic midwifery³ I called attention to the advantage offered by my occlusion dressing of rendering preventive injections after the birth of the child superfluous, and thus avoiding one great source of infection. The same subject is discussed at greater length on pp. 88 and 89 of my *Guide*.

¹ Doléris and Butte, in *Nouvelles Archives d'Obstétrique et de Gynécologie*, 1886, p. 739, et seq.

² Von Herff, *Centralbl. f. Gynäk.*, 1886, vol. x. p. 618.

³ Garrigues: *Prevention of Puerperal Infection*, *Medical Record*, December 29, 1883, vol. xxiv. p. 703, et seq.

Sometimes the injections were repeated too often. Thus we find in one case (XVII.) that intra-uterine injections of 1 : 1000 were given from two to six times daily. Even in serious cases of infection I usually find one intra-uterine douche in twenty-four hours sufficient, and never give more than two. This I ascribe to the use of my occlusion dressing and Ehrendorfer's intra-uterine suppositories.¹

In no less than five cases (IV., IX., XI., XIII., XVII.) death followed the use of corrosive sublimate after abortion. Maybe the inside of the uterus is more fit for absorption at this early date of pregnancy than when, at term, the separation between the ovum and the maternal organism takes place in a layer that has undergone particular changes for that purpose. Or else, the placenta being oftener adherent in abortion cases, fingers or instruments are oftener needed to peel it off from the womb than at term, and thus more frequently new wounds are produced in its interior. The cervix is likewise often torn in cases of this description.

In several cases (VIII., XII., XVII.) the use of the corrosive sublimate was continued in spite of the appearance of symptoms which now, the grave danger of poisoning being known, should call for the immediate substitution of another antiseptic.

In this connection it may, perhaps, not be amiss to collect in one place the symptoms that have been observed in cases of poisoning caused by vaginal or intra-uterine injection with corrosive sublimate:

The alimentary canal. Thirst, foul breath, metallic taste, red or bluish color and swelling of the gums; redness, ulceration, and sloughing of different parts of the mucous membrane of the buccal cavity; deep ulcers in the tonsils; soreness and looseness of the teeth, and sometimes salivation; vomiting, abdominal pain, tenesmus; profuse stinking, often bloody, diarrhœa. The feces contain mercury. It has been found in numerous cases, after vaginal or intra-uterine injections of a solution of 1 : 3000, followed by the injection of plain water. Even when the solution was so weak as 1 : 4000, it was found in one case, but in the others not. In the majority of cases it is already found the next day; and it is yet found a long time after discontinuing the use of the bichloride.²

The uropoëtic system. There is a marked diminution in the amount of urine, rising to absolute suppression of the secretion. The urine is dark, grumous, contains much albumin, mercury, epithelial cells from the kidneys, and hyaline or granular casts.

The *skin* is often wet with perspiration; it has been found hyperæsthetic, itching, pale, or erythematous. Sometimes there is considerable swelling of the subcutaneous tissue.

The nervous system. In the beginning the patient is restless, and suffers from insomnia; later she becomes drowsy, sometimes delirious; and,

¹ Guide, pp. 59 and 93.

² G. Braun: Wiener med. Wochenschr., 1886, pp. 822 and 848.

finally, she collapses. In some cases spasmodic twitchings or cataleptic stiffness has been found in the extremities. The pupils are sometimes contracted as in opium poisoning. Sometimes there is a sensation of being choked.

The *pulse* is rapid and weak, the temperature subnormal.

Of these symptoms the most characteristic are the diarrhoea, the diminution or suppression of the urinary secretion, the stomatitis, the low temperature, and the presence of mercury in the urine and the stools, which may be found by chemical analysis.

The chief changes found after death are hemorrhagic infiltration and extensive ulceration, sometimes diphtheritic patches and sloughs of the large intestine. In some cases a lower degree of inflammation is found in the ilium. Exceptionally, the œsophagus has been found inflamed. In some cases there has been found local peritonitis.

In the mouth and throat are found the above-mentioned changes.

Another constant change is parenchymatous nephritis. Sometimes deposits of phosphate or carbonate of lime are found in the convoluted or straight tubules, but these calcareous deposits are often absent, and may, on the other hand, be found under different circumstances.¹

In some cases the substance of the brain was found dry; in others there were extravasations of blood in the meninges.

We have seen that in some of the above-mentioned cases it is doubtful whether death was referable to the poisoning, and that in most of them too strong a solution of the drug, or too large a quantity, was used, or that it was used in improper cases, or continued after the appearance of symptoms of poisoning. Still, there are two cases which go far to show the dangerous character of injections into the genital canal with corrosive sublimate. In one (XIV.), a single intra-uterine injection of two quarts of a 1 : 4000 solution given eight days after delivery, caused fatal hemorrhage from the bowels. In another (VII.), only vaginal injections were used; only two were given; both were given before delivery; the strength was 1 : 2000; at most, two litres were injected; the patient was young, robust, and in perfect health up to the time of the injections, and still they caused her death. The only clew we have to a wound being present is the discharge of bloody mucus before examination; but this may only mean that the os began to be expanded and was a little nicked, as is commonly the case with primiparæ, or there may have been some bleeding granulations round the os. Since the symptoms of absorption of the fluid appeared immediately, it is not unlikely that part of the fluid may have been injected between the uterus and the ovum, and thus come in contact with a larger raw surface, from which absorption took place, or that it entered an open vein.

¹ Eugen Fraenkel, Archiv für pathol. Anat., Berlin, 1885, vol. xcix. p. 278.

It must be admitted that there may have occurred more cases than those published, or that of the latter some may have escaped my researches; but, to judge by the evidence, we must say that the danger of causing death in obstetrical practice by a judicious administration of vaginal and intra-uterine douches is a small one, and if we think of the many lives that undoubtedly have been saved by its use, we ought not to be in a hurry to give up a drug that has marked a new era of unparalleled diminution of infection and death. At all events, its use for the disinfection of the patient's outer surface and the hands of the obstetrician and the nurse ought to be kept up until we find another disinfectant that is as good, and less dangerous.

As to vaginal and intra-uterine injections I think bichloride of mercury is contra-indicated in cases of anæmia because of the greater tendency to absorption; in abortion; in patients affected with kidney disease, or who suffer from diarrhœa. In other cases I think it is also better to desist from them provisionally, and substitute less dangerous antiseptics; but should, under the use of these drugs, the morbidity and mortality from sepsis increase, I would not hesitate to return to the universal use of corrosive sublimate, with the exception of the above-named classes of cases in which it is counter-indicated.

The drug that has given the best results next to corrosive sublimate is *carbolic acid*, but I do not feel like going back to its general use in all cases and for all purposes. I regret that time will not permit me to search the records of this drug as I have done for corrosive sublimate. I wish somebody else would do it and lay the results before the profession. But in looking up the literature concerning corrosive sublimate, I have found enough to know that carbolic acid has caused alarming conditions and deaths, and I should not wonder if a more extended search would show that, while much less effective against the microbes, it is as dangerous for the patient as corrosive sublimate. Spiegelberg¹ saw loss of consciousness and death follow an intra-uterine injection of 1.5 per cent., and at the autopsy no signs of air or fluid having entered a vein could be found. Pick² delivered a woman in her tenth confinement by an easy version and extraction, and gave an intra-uterine injection of a 2 per cent. solution of carbolic acid. The patient died three hours after the birth of the child, complaining of oppression of the chest and lack of air; no autopsy. Küstner³ has seen cases of poisoning from intra-uterine injections reach a most alarming height, and similar acci-

¹ Berliner klinische Wochenschr., 1879, quoted by Mangin: *Nouv. Archives d'Obstétr. et de Gynéc.*, 1888, iii. p. 55.

² R. Pick: *Deutsche med. Wochenschr.*, 1885, Nos. 18-19; *Schmidt's Jahrbücher*, vol. ccvii. p. 273.

³ Otto Küstner: *Centralbl. f. Gynäk.*, 1878, vol. ii. p. 314.

dents have happened to Mäurer,¹ Veit,² and Briggs.³ Küster⁴ has seen six cases of fatal poisoning in surgical practice by irrigation of wounds.

The injection of the puerperal uterus with a 5 per cent. solution causes prompt death in bitches (Glöckner⁵).

While carbolic acid presents similar dangers as to health and life as corrosive sublimate, it is, on the other hand, not so effective an antiseptic as the latter. The commonly used solution of 2 per cent. has even been experimentally proved to possess rather weak antiseptic properties. This view is corroborated by abundant clinical experience in my own practice and that of others.⁶

The daily use of carbolic acid is very irritating for doctors and nurses. The skin cracks and smarts, the fingers become numb, there is a very disagreeable sensation of cold in the hands, and the whole nervous system is affected by it. Many steel instruments lose all their polish, become dull, stained, and are difficult to clean. Its odor, too, especially when mixed with lochial discharge, is very disagreeable and tenacious.

When carbolic acid is used, it is best to combine it with hydrochloric or tartaric acid, which enhances its antiseptic value very much. Two parts of carbolic acid, two parts of tartaric acid, and one hundred parts of water make a good solution.⁷

Other antiseptic drugs that deserve consideration, at least under certain circumstances, are thymol, boracic acid, acetic acid, hydronaphthol, permanganate of potash, chloride of zinc, salicylic acid, etc.

Thymol may be used in 1:1000 watery solution. It is a rather weak antiseptic, but has a very pleasant odor. Boracic acid is particularly recommended for patients suffering from albuminuria, cases in which carbolic acid is as little admissible as corrosive sublimate. It is said to diminish the quantity of albumin in the urine and increase the diuresis. It does not form obnoxious compounds in the tissues; it is innocuous and efficient.⁸ I have used the saturated solution (4 per cent.) with benefit in intra-uterine injections, when carbolic acid was not well borne. Acetic acid has recently been recommended in 3 and 5 per cent. mixtures.⁹ Hydronaphthol has been highly recommended by George B. Fowler, of

¹ Centralbl. f. Gynäk., 1884, vol. viii. p. 487.

² Berliner klin. Wochenschr., 1879, No. 3.

³ A. Briggs: Sacramento Medical Times, 1887, No. 2; Centralbl. f. Gynäk., 1888, p. 384.

⁴ Ernst Küster: Ein chirurgisches Triennium, Berlin, 1882, p. 20.

⁵ Glöckner: Die Irrigation des puerperalen Uterus, speciell. mit Carbolsäure, Thesis, Dresden, 1886, quoted by Blanc: Lyon Médicale, 1888, vol. lviii. p. 563.

⁶ See Guide, pp. 12-21. Torggler: Centralbl. f. Gynäk., 1888, vol. xii. p. 760.

⁷ Dujardin-Beaumetz: Bulletin Général de Thérapeutique, Paris, 1888, vol. cxv. p. 401.

⁸ Johnson: Nordiskt Medicinskt Arkiv., vol. xvii. No. 9. Bergonzini and Fregnani: La Rassegna, Dec. 1886, p. 545, quoted by Davis, Medical News, 1887, vol. l. p. 312.

⁹ F. Engelmann: Centralbl. f. Gynäk., 1888, vol. xii. p. 433.

Brooklyn, N. Y., and R. J. Levis,¹ of Philadelphia, as effective and not poisonous; as a proprietary drug it is, however, not admitted in the institutions under the care of the Commissioners of Public Charities. Permanganate of potash has been praised in puerperal fever by Chadwick, Sinclair, and Goodell.²

I have myself in former years in cases of diphtheritic endometritis used intra-uterine injections with a fluidrachm of an 8 per cent. solution of chloride of zinc, preceded and followed by a 2 per cent. solution of carbolic acid. In a solution of 2:1000 it has been used in large quantities, but, according to Koch, it is a weak germicide.

Salicylic acid requires 300 parts of water for its solution, but by mixing it with borax it becomes much more readily soluble. Combined with boric acid, it is often used for irrigation in surgical practice (salicylic acid 1 or 2 parts, boric acid 5, water 1000).

Creolin, which in several respects is particularly suitable in obstetric practice, will presently be discussed.

As to the way of administering injections I refer to my *Guide*. Here I would only add the following suggestions found in searching recent literature for this paper. Those who use bichloride of mercury would do well to let an injection with plain boiled water follow. G. Braun³ wants even distilled water, but that would in most cases not be feasible.

The addition of sodium chloride to the solution of bichloride of mercury greatly increases the absorption⁴ and ought, therefore, to be avoided.

If, during an injection through a single tube, such as I always use, the cervix contracts and prevents a free outflow of the fluid, the bag or can of the fountain syringe should be lowered below the level of the bed.⁵ In this way not only the influx is stopped, but the current is reversed, the fluid being sucked out from the cavity of the uterus through the tube, by siphonic action.

II. CREOLIN.

Creolin is one of the latest antiseptics and seems to possess qualities which recommend it highly for a thorough trial. It was first brought on the market by the firm of William Pearson & Co., Hamburg, Germany. The literature in regard to it begins in 1887 and is yet quite scant.

It is a black fluid of the consistency of a thick syrup. It looks and smells much like coal-tar and is obtained from English coal. Its chemical composition is yet unknown. When a drop falls into water it forms a white cloud that gradually mixes with the water. Creolin does not

¹ New York Medical Journal, 1885, vol. xlii. p. 374, et seq. Ibid., p. 593.

² Trans. Amer. Gynecol. Soc., 1879, vol. iv. pp. 119, 123, 133.

³ Wiener med. Wochenschrift, 1886, Nos. 21 to 24.

⁴ Edw. P. Davis, loc. cit., p. 308.

⁵ A. Mangin: Archives d'Obstét. et de Gynécol., 1888, p. 58.

dissolve in water, but forms, up to 12 per cent., a homogeneous emulsion with it. The weaker grades are milk-white, the stronger light brown, like coffee mixed with much milk. After a long time a deposit is formed, but the fluid has about the same power as before.

Its great antiseptic value, in which respect it is claimed to be second only to bichloride of mercury and very superior to carbolic acid, has been tested experimentally by Esmarch,¹ Eisenberg,² and Washbourne.³ Eisenberg found that a three per cent. solution kills all germs in one minute, and a five per cent. in ten seconds, the shortest time in which it is possible to make the experiment.

Up to three per cent. the emulsion is very pleasant to feel on the skin; a five per cent. solution smarts a little after protracted impression. The mucous membranes are more sensitive. Even a two per cent. solution smarts on the tongue and in some parturient women in the vagina. One-half to one per cent. was well borne when injected into a dog's bladder, while two per cent. caused hematuria (Eisenberg). Kortüm⁴ found that irrigation of ulcers with a two per cent. solution was pleasant to the patient. Neudörfer⁵ states that a stronger solution than one-half of one per cent. irritates wounds and causes pain. It produces the liveliest granulation and healing where all other substances fail.

In contradistinction from most other antiseptics, especially bichloride of mercury, it makes the surface with which it comes in contact soft and slippery.

It has a very considerable hæmostatic power. At first it was claimed that it had another advantage over most other antiseptics by being entirely innocuous. A dog swallowed thirty grammes (about 3j) and did not show any disturbance (Eisenberg). F. Späth and several other members of the house staff of the Hospital of Munich took for some time up to 2.7 grammes (about ʒ xl) in a single dose, and 8 grammes (about 3ij) in the course of the day. They felt well, did not vomit, and had an excellent appetite.⁶ They gave it with benefit to patients in doses from 0.5 to 1 gramme (ʒ viijss-xv).

The claim to innocuousness has, however, been challenged, and there has even been attributed a death to the use of creolin. As the question is of much importance just now, when we are trying to find a drug to replace corrosive sublimate, I let an abstract of the history of that case follow:

(Dr. Heinrich Rosin, *Therap. Monatshefte*, 1888, p. 480.)—Primipara, æt. twenty-seven; narrow pelvis; neglected transverse presentation. *Embryulcia*

¹ Centralbl. f. Bakteriöl. u. Parasitenkunde, vol. ii., Nos. 10, 11.

² Wiener med. Wochenschrift, 1888, vol. xxxviii. 564, 605, 641.

³ Guy's Hospital Reports, 1888, pp. 365-378.

⁴ Berliner med. Wochenschrift, 1887, p. 861.

⁵ Internat. Rundschau, 1888, p. 664.

⁶ Münchener med. Wochenschrift, 1888, vol. xxxv. p. 247.

partially performed before admission to the hospital and finished there. Then the uterus and vagina were douched with a two per cent. solution of creolin, and about *four quarts were used for the intra-uterine douche*. Four hours after the termination of the operation the temperature was 39°C . ($102.2^{\circ}\text{Fahr.}$); the next morning 36.5°C . (96.8°Fahr.). In the afternoon the temperature rose again to 39°C . ($102.2^{\circ}\text{Fahr.}$). A second intra-uterine injection of about a litre of a one per cent. solution of creolin was given. There was a somewhat offensive discharge, yellow deposit on the erosions of the labia minora and the vagina, a laceration of the perineum, and œdema of the labia majora; the mind was clear and the patient felt well.

The third day, the morning temperature was 38°C . ($100.4^{\circ}\text{Fahr.}$), and the fetid discharge continued. A similar intra-uterine injection of the same strength and the same amount was given. At 6 P.M. the temperature, pulse, and respiration were normal, and the patient could without any fatigue leave the bed, and *without any help mount on the gynecological chair used for the administration of the injections*, where a fourth intra-uterine injection with creolin was given. At 9 P.M. she became suddenly pale and cold, and vomited violently. Temperature 37.2°C . (99°Fahr.). The vomiting continued, perspiration broke out, the temperature fell to 35.9°C . (96.6°Fahr.), and at 11 P.M. the patient died in collapse.

The vomit had a very strong odor of creolin, and being distilled formed with brominated water a copious precipitate of tribromophenol.

The autopsy revealed, beside the above-mentioned deposits on the excoriations of the vulva and vagina, a dark-brown, soft layer on the placental site that could be easily scraped off. Small hemorrhages were found under the pericardium, and fifty cubic centimetres of a slightly bloody transudation in its cavity. The other organs normal. The urine had a strong odor of creolin, but did not contain albumin or sugar.

The case is indeed open to much criticism. One of the most dangerous operations in all obstetric surgery had been performed on the patient, and when it was half performed she had been transported to the hospital, circumstances which certainly favored the development of septicæmia, of which we also find symptoms in the fetor of the lochial discharge and the abnormal condition of the wounds. The patient was exposed in an unjustifiable way by being ordered to go alone and lie down on an examining chair, and the first time at least an enormous quantity of fluid was used. Still, the condition found post-mortem tallies well with that found by Neudörfer in a dog which he killed by injecting pure creolin into the veins.¹ But even if death in this case was due to the use of creolin, a single case does not prove much, since the patient may have had an idiosyncrasy for the drug, as is so often found in regard to other drugs.

There has, however, been reported another case of a slight degree of poisoning.²

The patient was a boy, æt. five, who had been successfully operated on for hernia. During the operation a 2 per cent. creolin solution was the only antiseptic used. After the operation it was used in applications to the wound. On the evening of the third day a scarlatinous eruption appeared over the whole body, face, and hands, accompanied by restlessness, thirst,

¹ Internat. Rundschau, 1888, p. 614.

² H. Cramer: Therapeutische Monatshefte, December, 1888, p. 573.

itching, and burning in the skin. The urine was dark as in cases of absorption of carbolic acid, had a similar odor, and contained a small quantity of albumin. Pulse and temperature normal. Boric acid was substituted for creolin, and all disturbance ceased in the course of twenty-four hours.

Neudörfer found that the injection of *pure* creolin into the venous system of dogs, in doses of one gramme (gr. xv), repeated three times at intervals of from five to fifteen minutes, produced death, which was preceded by pain, salivation, and convulsions. At the autopsy, the heart, liver, and kidneys were found to be filled with blood, while the spleen was quite bloodless.

This experiment does not prove much as to the poisonous properties of creolin, since it can easily be imagined that the introduction of a cubic centimetre of so thick a fluid undiluted into the blood may cause fatal disturbances of a mere mechanical nature. Washbourne¹ has shown, experimentally, that it is poisonous to mice when injected under the skin. But that is not a proof that it is so to man.

From these different experiments it would appear that if it is not entirely innocuous, it can be taken even internally in large doses by men and higher animals without any detrimental effect.

Its odor is rather pleasant, and does not cling to a person and his clothes so long as carbolic acid. Still, the odor is strong enough to cover a moderate degree of fœtor. In that respect it equals carbolic acid and is inferior to corrosive sublimate.

It is a drawback that the emulsion is not transparent. Thus, the field of operation is obscured if it is used for irrigation. Shreds coming out from a cavity like the uterus cannot be seen. Small instruments, such as knives, scissors, needles, etc., are entirely hidden if covered with the emulsion.

In Germany it is a very cheap antiseptic. It is retailed in the original bottle containing four ounces for sixty pfennigs, about fifteen cents. According to information received from the druggist of Charity Hospital, it costs the hospital sixty cents per pound, while crystallized carbolic acid costs fifty cents, corrosive sublimate, of which forty times less is used, sixty-five cents, and acetic acid seven cents.

During my last term of service at Maternity Hospital, from January 1 to April 1, 1889, I used it in a two per cent. emulsion on all patients for the vaginal douches during labor; for the intra-uterine injections immediately after delivery in cases that demanded such preventive interference on account of the hand having been introduced into the cavity of the uterus during or after delivery; and for vaginal injections after low forceps operations, perineorrhaphy, and in cases of fetid lochial discharge. Making allowance for the first few days, when we were not

¹ Loc cit., p. 378.

yet prepared to use the new drug, it was used on one hundred patients. Upon the whole I am much pleased with it. We had no deaths from any cause, and only one case of septic metritis, which I think was due to the presence in the same ward, in the neighboring bed, and under the care of the same nurse, of a bad case of ulceration and abscess of the buttocks in a paralyzed patient. The latter was removed to Charity Hospital, the patient with metritis was isolated and recovered in a few days.

In several respects creolin recommends itself particularly to the obstetrician. Its property of making surfaces slippery is of great value in operations, especially turning. Its great hæmostatic power makes it a most desirable drug for intra-uterine injections immediately after delivery. Its lack of transparency is of no importance in the use of large instruments, like a forceps or a perforator. So far, I have only found one class of cases to which it is not suitable, namely, those in which the inside of the womb is affected, and we want to judge of its condition by means of the appearance of the injection fluid returning from it. Under such circumstances a transparent fluid, such as the solutions of carbolic acid, acetic acid, or boracic acid, is preferable.

In private practice creolin may even supplant corrosive sublimate altogether. I have used it in a two per cent. solution for my perineal pad with perfect satisfaction.

Since a deposit is precipitated by standing, it is best to make the emulsion *ex tempore*. The creolin should be poured into the water, not the water poured on the creolin, as by the former procedure a better mixture is obtained. It ought first to be mixed with *cold* water, and then hot water added until the desired degree of temperature is reached. If it is first mixed with hot water numerous small black specks are formed which do not dissolve later.

The two per cent. solution I have used causes in some patients a little smarting, but it seems to be quite tolerable, even in refined and nervous ladies. It ought to be used with all the same precautions as corrosive sublimate. For a vaginal douche a quart is sufficient; for a combined vaginal and intra-uterine, three pints may be needed. Its return should be carefully watched. It should be squeezed out of the uterine cavity during and after injection, and removed from the vagina by turning the patient on the side.

CONCLUSIONS.—1. The solution of bichloride of mercury used for vaginal and intra-uterine injections ought not to be stronger than 1 : 5000.

2. No more than one to one and a half quarts should be used.
3. The fluid should be removed from the uterus and the vagina.
4. No injections should be used in normal cases after the birth of the child.

5. Intra-uterine injections should not be given oftener than once or twice in twenty four hours, vaginal every three hours.

6. The symptoms and signs of absorption should be constantly looked for, and the use of the bichloride discontinued at their first appearance.

7. The injections should not be used on patients suffering from anæmia, abortion, kidney disease, or diarrhœa.

8. It is safest to abstain from the mercurial injections altogether until experience shows that the corrosive sublimate gives better results than any other antiseptic.

9. Corrosive sublimate should be used for disinfection of the outer surface of the patient, for the hands of doctors and nurses, and for materials brought in contact with the patient.

10. Carbolic acid is, perhaps, as dangerous in injections as corrosive sublimate.

11. Other less effective germicides may occasionally answer a good purpose.

12. Creolin is an excellent antiseptic, little poisonous, a powerful hæmostatic, and makes all surfaces slippery—properties that recommend it especially in obstetric practice.

LE FORT'S OPERATION FOR COMPLETE PROCIDENTIA OF THE UTERUS, WITH A REPORT OF A CASE.

BY CHARLES E. TAFT, M.D.,
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I DESIRE to call attention anew to the advantages of the radical cure of complete procidentia of the uterus by an operation, at one time highly extolled, especially abroad, but now, I suspect, not generally known to the profession at large—what is known as Le Fort's operation; also to speak of its relative advantages as compared with several other operations advocated as radical cures for this condition. While the majority of these cases are perhaps not suited for this operation and can be cured in other ways, there are undoubtedly a large number of miserable women dragging out a tired, weary existence whose lives are embittered toward the medical profession on account of numerous and unsuccessful operations, such as anterior and posterior colporrhaphies, and of vain and painful attempts to wear that former panacea for all uterine disorders, a pessary, who would be permanently cured by an intelligent use of this operation.

In 1823, Gérardin first suggested this operation, but did not perform it. Forty-four years afterward, in 1867, Neugebauer, of Cracow, did the

operation successfully, following out Gérardin's suggestion, and called it "*Elytrorrhaphia mediana sive elytrocleisis partialis mediana.*" In 1876, M. Léon Le Fort, of Paris, described substantially this same operation, and since has succeeded in having it introduced under his name—the only difference being that Le Fort's denudation was a little longer and narrower than the other and that he allowed the sutures to slough out instead of removing them as did his predecessors. If I am not mistaken, this operation was first done in this country by Dr. Fanny Berlin, of Boston, who, in 1880, reported three successful operations performed at the New England Hospital for Women. While the operation has received general recognition in France and been successfully performed there many times, in England and America it has not, I think, attracted the attention which it merits. In the recent textbooks on gynecology, with but three or four exceptions, there is no criticism of it, nor is it even mentioned.

The description of the operation by Le Fort as given in Mundé's book on *Minor Surgical Gynecology*, and Thomas in his work on *Diseases of Women*, is as follows :

"The uterus being entirely outside of the vulva, without reducing it, I make on the anterior wall of the vagina, the patient lying on the back, four incisions, cutting out a portion of mucous membrane which yields me a raw surface about six centimetres long by two wide upon the part nearest to the vulva. Then lifting toward the abdomen the prolapsed uterus so as to see the posterior face of the tumor, I make on this part a raw surface similar to that on the anterior wall. This being done I in part replace the uterus so as to bring the extremities of the two raw surfaces in contact where they are nearest the uterus. I then apply on the transverse border three sutures, reuniting longitudinally the anterior and posterior walls of the vagina; I then proceed to the reunion of the lateral borders by passing from each side a silver thread, traversing the border of the anterior freshened surface. A thread being placed in a similar manner on the opposite side and at the same level, it is sufficient to tie these sutures to increase by the apposition of the opposite vaginal walls the reduction of the uterus. This reduction is completed gradually as the sutures are put in place, and when the two raw surfaces have been united throughout their extent, the reduction is complete. The threads which have served as sutures for the transverse border nearest the uterus, being hidden in the depth of the vagina, are difficult of access when after several days union is effected; therefore it is wise to give to these threads sufficiently great length in their twisted part, in order to seize them easily when they become free after section of the part embraced in these loops."

This operation is certainly not suited for every case of procidentia of the uterus. Each must be judged on its own merits. It has, to be sure, been performed on women both before and after the menopause and successfully; but its advocates do not claim any such wide field. Limited to suitable cases which have passed the change of life, they do claim that no other operation gives as good results and as perfect immunity from relapse.

Before discussing further its value and its limitations let us for a

moment briefly consider what other operations might be, or have been performed as radical cures for that condition and at that period of life for which Le Fort's operation is suited.

Within the past decade, the most important and most successful of all the different methods of radical cures for this *bête noire* of gynecology have made their appearance, and I am certain that one can now confidently assure his patient that a cure is possible and that too, without the subsequent wearing of instruments, although the latter is very often desirable.

Preëminent among these are Emmet's operation on the anterior wall combined with a thorough posterior colporrhaphy, and Alexander's operation supplemented by the two former operations.

The former of these two combinations, with slight modifications, is unquestionably in more general use in this country than the latter; and in certain cases, even after the menopause, will undoubtedly remain for many years the favorite method of radical cure. Yet it has several disadvantages which, I think, are serious ones, not so much in the case of the specialist as for the general practitioner. Emmet's operation on the anterior wall is certainly not an easy operation, nor is it one which can be done quickly. If it does not wholly succeed, it is apt to prove of but little benefit to the patient, and necessitates its repetition. It must be done with the patient in Sims's position, and requires a skilled assistant.

Whether the objection urged against other colporrhaphies, that the operation causes a puckering of mucous membrane about the mouths of the ureters and their consequent obstruction, is true here, I am unable to say; certainly several cases have escaped thus far of which I am personally cognizant. In spite of these objections, when it is decided that the cure of a procident uterus is to be attempted by this method, I firmly believe that Emmet's operation on the anterior wall should be used in preference to all others, as it not only theoretically but practically accomplishes more than any other anterior colporrhaphy.

With regard to the perineorrhaphy, so many varieties have been brought forward, many of which differ but a very little, either in the denudation or insertion of sutures, that it would be a Herculean task to give them all due mention. Personally, I prefer an operation similar to that recently described by Dr. A. P. Dudley, of New York, only with an unusually high denudation. Dr. Emmet's operation takes considerable time, requires many sutures, and, judging from what I have seen of it, unless more than ordinary care is used, the sutures which come at the crest when the operation is completed are very likely to slough out. Every perineorrhaphy, however, must be carefully adapted to the case in hand. Again, doubtless every man succeeds best with the operation with which he is most familiar, other things being equal.

Statistics as to the success of this combination of operations for the

cure of procidentia uteri are extremely unsatisfactory. It is evident at once that most of the cases reported *cured* have not been followed up but for a short time after the operation. This is especially true of those reported in this country.

In order to insure success by this method, all erosions must be healed, the lacerations of the cervix repaired, and the size of the uterus reduced. Where there is marked atrophy of the parts, in an old and enfeebled patient, success is not likely to perch on the banner of the operator. Among the poor it is often exceedingly difficult to secure proper care after these operations. They neglect themselves, work hard, and are liable to lift heavy weights. A recurrence under these constant, and occasionally severe strains, is not remarkable. It simply teaches us that we should adapt our operation to our patient's position in life as well as to the individual peculiarities of the displacement.

Under such conditions, other things being equal, I believe Le Fort's operation to be superior to the ones just mentioned. Moreover, where anterior and posterior colporrhaphy have been alone performed, it is often not only wise, but essential, that the patient should wear an instrument for a considerable length of time as an additional support, and to remove the constant strain from the parts until the cicatrices become firm. Le Fort's operation does not even permit of the wearing of such an instrument. Now, how much better it is to have the operation done, and that end it—no wearing of instruments or fussing with supports of any sort, and but a slight probability of a return of this annoying condition.

As a matter of fact, from what I have learned of cases personally followed up and from the writings of others, I believe that where anterior and posterior colporrhaphy have been alone performed, the majority of the cases have sooner or later suffered a return of the prolapse. This, as I have already indicated, I believe to be due to insufficient preparatory treatment, to incomplete union of the denuded surfaces, lack of after-care on the part of the patient, and to not wearing a suitable pessary. Then, again, the majority of such operations are worse than useless, as commonly performed, for there is either too small a denudation of both anterior and posterior surfaces, or too tight adjustment of sutures with subsequent sloughing.

If one may judge from the recorded results of several American operators as well as European, Alexander's operation, or the shortening of the round ligaments, is a decided addition to the operations just mentioned. Unfortunately for this operation, however, it is much easier to describe than it is to do.

In the *first* place, according to the testimony and results of a number of men, and from what I have myself seen, in a comparatively large number of cases it is exceedingly difficult and sometimes impossible to find either one or both ligaments.

Second. In a certain proportion of cases, small to be sure, but still occurring rather frequently, the ligaments when found are so slight that their power to support the uterus is practically *nil*, and this is especially likely to be the case after the menopause—the round ligaments having in many instances participated in the general atrophy of the female organs which takes place at that period of life.

Third. In a small proportion of cases adhesions of the round ligament to the canal are found, causing it to break before it can be drawn out.

Fourth. After swinging the uterus up in its new position there is still a liability to a relapse from a renewed relaxation of the ligaments and from the continued dragging down of the heavy uterus. The danger of this latter event is, however, slight if the Alexander's operation has been supplemented, as it always should be in a case of this nature, by plastic operations on the vagina.

It must be remembered that probably the majority of cases reported as cured by this operation have occurred when the patient was suffering simply from a backward displacement of the uterus, and where the various ligaments were but slightly relaxed, and the perineum was intact. But a large enough number of successful operations for a complete procidentia by this method have been reported to demonstrate unquestionably its usefulness in this condition also.

In regard to the dangers of the operation, Polk states that he considers Alexander's operation neither difficult nor dangerous, provided the operator takes proper antiseptic precautions, and is familiar with the anatomy of the parts. A number of operations by leading gynecologists, advocates of this operation, and presumably familiar with the anatomy of the parts, which I have had the pleasure of witnessing, would lead me to doubt Dr. Polk's first assertion, inasmuch as several of them were far from successful, either in the immediate operation or subsequent results. I should also feel obliged to qualify that statement by inserting a provision that more than Alexander's operation should not be attempted at one sitting, for I am familiar with one case where the patient died apparently from no other reason than the prolonged shock of this operation, combined with plastic operations in the vagina. Septicæmia has also claimed a few victims; probably, as Dr. Polk suggests, from a lack of proper antisepticism.

Firing has recently described an operation for prolapsus uteri which has been performed for several years by Frank, and which seems to be an entirely new departure. This procedure consists in splitting up the posterior vaginal wall to the fornix, thus separating the rectum from the vagina, and then folding up the vaginal mucous membrane and stitching it just below the cervix, by means of buried catgut sutures. This forms a large projection in the posterior vaginal wall. The denuded vaginal surface is then stitched together in the usual manner.

He reports good results, and no return, in some instances even seven years after the operation. Not having seen the operation done, I do not feel prepared to criticise it, but should imagine that whatever support was derived from the projection of tissue on the posterior vaginal wall would soon be lost from its atrophy; and, aside from this, I also fail to see in what respect the subsequent attachments of the vagina would differ from those caused by an ordinary posterior colporrhaphy.

While the operation of hysterorrhaphy, first performed by Köberle, of Strasburg, in March, 1869, and subsequently strongly advocated by Oldhausen, Kelly, and Sänger, has been more especially used to cure a retroflexed and adherent uterus; still a few cases of marked prolapsus uteri have been also fully relieved by this method. Kelly, in his recent article on "Hysterorrhaphy," in *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, reports two such cures out of three cases operated on. So far as the objections relating to the dangers of the operation are concerned, they will hardly hold good in suitable cases, as but one patient out of over ninety operated on up to October, 1888, has died. On account of the tremendous strain on the stitches and subsequently, on the adhesions uniting the uterus to the abdominal wall, which must necessarily be present where a procident uterus has been so attached, it would seem improbable that a successful result should follow if the uterus was much enlarged, or if the hysterorrhaphy was not supplemented by a high posterior colporrhaphy.

Brandt's system of massage should properly be spoken of in connection with the use of pessaries, etc., rather than in a paper treating of radical operations; but as it has so recently been brought forward, and as its author claims so much for it—in fact, considers operations quite unnecessary in most cases—it may be proper to criticise it somewhat. He believes that procidentia of the uterus can be cured at practically any age, and reports a series of cases in which he has had most excellent results. It seems obvious that, as the treatment must necessarily extend over a long period, many women will not have the patience, time, or money to follow it up, and give it a thorough trial. Then, again, it necessitates a skilful assistant at each treatment. It would seem, although its author, I believe, claims that it does not happen, that a relaxation of the parts would follow in all, or, at any rate, in a majority of the cases, after a varying length of time. If, however, only one-half of what he claims for his method proves to be true, it will be a great gain for gynecology.

I shall not speak of the indications for a radical operation, but will simply say I believe that, with but few exceptions, an operation for the radical cure of the prolapse should be strongly advised in preference to the use of pessaries or other means of support.

Before the menopause I believe an anterior and posterior colpor-

raphy, perhaps supplemented by Alexander's operation, offers the best result.

After the menopause I believe no other operation equals Le Fort's.

Of course, in recommending Le Fort's operation to a patient a full explanation of its effects should be made. Le Fort's idea in advocating his operation was, that it was not the uterus which descended first and dragged the vaginal walls after, but rather the reverse of this process. He, therefore, thought a radical cure could only be effected by keeping the vaginal walls permanently in contact, thus preventing the secondary descent of the uterus. He claims that re-descent can only take place through one of the two small canals, and thinks that this is very unlikely to occur if the operation is well done. The question, whether to use catgut or silk sutures, he considers of minor importance, believing it to have but little to do with the success of the operation.

Faucon, who has operated frequently and with excellent results, says that when there is a considerable hypertrophy of the cervix in addition to the prolapse, amputation of the cervix should be performed before doing the Le Fort's operation.

The great disadvantage of this operation, as I have already indicated, is that, as it presents an effectual bar to sexual intercourse, its field must be exceedingly limited, being restricted to widowed women after the menopause. In spite of assertions to the contrary by several writers, hardly anyone who has witnessed its performance could call it a simple and easy operation, for it requires no small degree of judgment and mechanical skill to fit accurately one denuded surface to the other, and to fasten the sutures just tightly enough to hold the surfaces in contact, and yet not so tightly that they will cut out. A. Sokoloff, who advocated this operation strongly in the *Ann. de Gynécol.*, xxi. p. 13, 1884, and reported a number of successful cases, says the only indications against the operation are the age of the patients and "*le renversement inégal des parois vaginales.*" It is possible, although so far I know of no case which would substantiate the suggestion, that an obstruction of the ureters may take place from a careless insertion of the sutures, so placed as wholly to occlude an ureter. That puckering of the mucous membrane of the bladder near the openings of the ureters which occasionally occludes their orifices after the more usual operations on the anterior vaginal wall can hardly take place here.

The advantages of this operation are many and manifest. The greater part of the entire operation can take place outside of the vagina. It can be most easily performed in the dorsal position. If successful, absolutely no other treatment except an occasional douche for cleanliness is needed, and it is attended with but little more danger than an ordinary perineorrhaphy. When the union of denuded surfaces is good,

I believe there is decidedly less danger of recurrence than from any other method of radical cure.

Fanny Berlin, of Boston, who has performed the operation three times successfully, says that "although applicable to only a certain class of cases, it seems to fulfil the desired result admirably." Dr. T. Gaillard Thomas, who has operated a number of times most successfully, says that "if after it the patient will wear a 'perineal pad' persistently it is perfect in its results."

Other successful operators have been Hicquet, of Liege, Eustache, Zancarol, of Alexandria, Prof. Duplay, Guéniot, Prof. Slajansky, and Neugebauer. Among the few in this country who have attempted this rather difficult operation are Drs. Anna Broomall, Mary Smith, Eliza Cushier, Mary Allen, and Fanny Berlin, of whom I have previously made mention, have all done one or more operations.

To illustrate the value of this procedure I will briefly report the history of a case of complete procidentia operated on by Le Fort's method, at the New York Woman's Hospital, during my term as house surgeon, in the fall of 1887, by Dr. T. Gaillard Thomas.

The patient's history was as follows:

Widow, aged sixty-one years. She had had ten labors, the last occurring nineteen years ago, none of which had apparently induced any uncomfortable after-results. Indeed, up to four years ago she had supposed herself to be a perfectly well and healthy woman. About that time micturition became more frequent, and she commenced to be annoyed by vesical tenesmus with an inability to empty the bladder completely. Backache, dragging sensations, and headaches followed. These symptoms gradually increased in frequency and severity, until they became quite annoying. But little was effected in the way of treatment, although she had consulted a number of physicians. Instead, the condition of affairs grew worse, until two years ago the anterior wall of the vagina made its appearance outside as a large cystocele. Within the past year the whole vagina rolled out, making a complete procidentia. She had tried ineffectually various instruments to keep up the displaced uterus, and becoming tired and impatient of further mechanical treatment had presented herself, determined to have a radical operation done.

Examination showed the uterus to be comparatively small and easily reducible. The mucous membrane of the vagina was not markedly hypertrophied. No erosions were present. The examination of her urine was negative.

As the patient was long past the menopause, it was decided to be an excellent case on which to test the value of Le Fort's operation. This was accordingly performed on October 29th, by Dr. Thomas, the method of procedure being essentially like that given by Le Fort. This operation was then supplemented by an ordinary perineorrhaphy. Catgut sutures were used.

The after-treatment consisted simply in passing the catheter every six or eight hours for the first thirty-six hours, the patient suffering from retention, and on the third day moving the bowels by a saline purga-

tive and enema. For the first two days the diet was liquid, after that time whatever the fancy of the patient dictated.

With the exception of a purulent vaginal discharge for the first week and a burning sensation on micturition everything did nicely and three weeks from the date of the operation the patient was allowed to walk about.

Examination demonstrated the entire success of the operation, the uterus being held high up in the pelvis and the line of union perfect. Two well-marked divisions of the vagina, similar to a double vagina could be easily demonstrated with a probe.

Being interested in the ultimate success of the operation I wrote to her in June, 1888, and received an answer stating that she had entirely recovered her strength, was able to do considerable work, and had had no return of her old symptoms. She had no bearing-down or dragging sensations and, so far as she was able to say, the operation was a perfect success.

This case and the successful operation performed need no comment. It tells its own story and is as strong a plea for Le Fort's operation in similar cases as one could make.

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CASE OF ANOMALOUS CARDIAC MURMUR, CONCURRING WITH FATAL CEREBRAL DISEASE.

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THE following case was incidentally referred to in a discussion on the subject of the murmur (so-called) of mitral stenosis, arising out of a communication by Dr. McVail to the Medico-Chirurgical Society of Glasgow, on 1st April, 1887. I then stated that it was the only instance occurring in my experience for a long series of years, which admitted at all of being construed as bearing in the direction of the late Dr. Austin Flint's theory as to the pre-systolic (auricular-systolic) murmur.¹ From this point of view, without dwelling on the case at the time, I was led to remark upon the infrequency of these apparent exceptions (even admitting them to exist) to the more current view which associates the pre-systolic, or auricular-systolic (A. S.), murmur with contraction or obstruction of one or other of the auriculo-ventricular orifices; and I also pointed out that Dr. Flint's theory does not, even if we suppose it to be established, afford any support at all to the view which professes to account for the pre-systolic (or A. S.) murmur as one of regurgitation; while on the other hand it confirms by comprehending or including the current theory, inasmuch as Dr. Flint did affirm, and believed himself to have proved, that extreme regurgitation at the aortic orifice may (though very rarely and occasionally) determine obstruction at the mitral orifice of a functional character, and therefore not demonstrable after death.

I should greatly desire that the readers of the present communication would associate it with the discussion now referred to, giving my views on the subject in a discursive fashion (*Glasgow Medical Journal*, September, 1887, pp. 224-229); or with the subsequent and much more elaborate statements and counter-statements which followed Dr. Dickinson's well-known reproduction of the regurgitation theory of the A. S. murmur. (*Lancet*, of successive weeks, from October 1 to November 19, 1887).

The importance I attached to the present case was not very great, being limited, in my judgment, both by the brief period of observation, and by some degree of uncertainty as to the facts. I was, therefore, at first disposed to regard the merely casual mention of the case as enough for practical purposes, especially as I afterward demonstrated the post-mortem appearances at a later meeting of the Medico-Chirurgical

¹ AMERICAN JOURNAL OF THE MEDICAL SCIENCES, January, 1886.

Society, and then placed the parts for reference in the Museum of the Western Infirmary at Glasgow. When Dr. Bramwell, however, made his communication to the *AMERICAN JOURNAL* for March, 1888, of a case observed in October, 1886, I placed the MS. of my own case in his hands, exactly as it was given to the Society, for publication if he should think it worth while; and it is only in consequence of this MS. having been mislaid (after being returned by him to me, with the expression of a wish that it should be published) that it has been held over till now.

Henry T., æt. twenty-four, admitted to Western Infirmary (Ward I) on 8th March, 1887, and died on 22d March; his symptoms being mainly cerebral, and such as to raise questions of possible surgical interference, as for abscess connected with disease of the middle ear. From this point of view the case has already been fully recorded in the *Glasgow Medical Journal* for October, 1887,¹ and it was there indicated that certain cardiac phenomena, detected very shortly before death, and in no way obviously connected with the cerebral aspects of the case, were passed over in order to avoid undue prolixity. These phenomena will now receive attention, with only so much of reference to the history as may be supposed to be even remotely connected with the lesion of the valves discovered after death.

The patient was a seaman, and was known to have led a very dissipated life, landing him in what seemed closely to resemble symptoms of delirium tremens shortly before admission. On admission, he was found to be affected with some kind of condensation over the left lower pulmonary lobe, with acute symptoms and friction sound. A suspicion was entertained of pericarditis associated with pleurisy of the left side, as will appear from the following note of March 11th: "Cardiac sounds free from murmur, but at the apex beat in the fifth interspace and a little above this, there is a double rub heard, suggestive of probable pericardial friction." After this, he passed into apparent convalescence and was able for some days to be up and to give a good deal of assistance in the ward, when cerebral symptoms suddenly rose into prominence and assumed a degree of importance which only ceased with his death.

It is not on record that any detailed examination of the heart took place between the 11th and the 17th of March, but at this date Dr. Gairdner personally made an observation, with a view to the important questions of diagnosis and prognosis emerging from the cerebral symptoms—not on account of any new thoracic manifestation. The result of this examination, so far as the heart is concerned, is included in the following notes, made the day before death: "A cardiac phenomenon noticed for the first time by Dr. Dunlop yesterday morning (March 20th), is considered by Dr. Gairdner as of doubtful interpretation, owing to the suspicion entertained of pericarditis at an earlier stage. The facts as regards this may be summarized as follows: The murmur heard to-day and yesterday is pretty decidedly of auriculo-systolic rhythm, but brief and rather indefinite in quality, so that even apart from the facts above stated Dr. Gairdner would have some difficulty in pronouncing upon it

¹ Three Cases of Brain and Ear Disease, considered with reference to Diagnosis and also to questions of Brain Surgery. Case I., p. 242.

absolutely as a murmur of mitral stenosis; although he would say that supposing it to be proved endocardial, it would be of this character.

"Dr. Gairdner's own recollection of a single observation made on the morning of the comatose attack (March 17th) inclines him to believe that a certain amount of murmur associated with the first sound may have been present throughout; the sound itself being wanting in clearness, and the murmur wanting in definition, so that at the previous observation it was not distinctly classified as auriculo-systolic or ventriculo-systolic, Dr. Dunlop has the impression that no murmur of auriculo-systolic rhythm was audible up to yesterday morning; but that whatever existed at an earlier period (when it was regarded as exocardial) was ventriculo-systolic. (It will be observed, however, that a 'double rub' is noticed in the report of the 11th.) As heard at present (21st), the murmur has a rumbling indefinite character, which makes it exceedingly difficult to predicate its relations to the first sound in a manner that can be regarded as unexceptionable; and this difficulty is increased by a peculiarity in rhythm which has set in apparently since the commencement of the observation. As heard yesterday, the murmur was to Dr. Gairdner's ear rather more decidedly auriculo-systolic."

It is absolutely necessary thus to record all these fluctuating phases of judgment on the bare acoustic phenomena, because no question at all was raised during life which rendered it necessary to entertain the diagnosis of aortic regurgitation, such as was discovered after death. It is even possible, considering the nature of the lesion, that the aortic regurgitation may not have been present on admission; and that the sounds which were at the first regarded as friction may have been really so, as there was noted after death some rough old deposit on the pericardium near the left apex. But it is certainly remarkable, both from the negative and the positive point of view, that the facts so elaborately and carefully recorded above should have been associated with the following post-mortem appearances, viz.:

"The heart is considerably enlarged, weighing sixteen ounces. On the right curtain of the aortic valve there is an aperture about one-half of an inch in diameter, the upper part of which is about one-eighth of an inch from the edge of the curtain. This aperture is surrounded by lobulated projections of a white color which protrude from the ventricular surface. There is some more red-colored deposition on the valve beneath these. The left lung is slightly adherent posteriorly. There is on the basal surface a somewhat thick deposit of tough fibrin. The lower lobe of this lung, and the lower part of the upper lobe present an œdematous semi-condensed condition. The right lung is non-adherent and otherwise normal."

In placing this case on record, I am very well aware of the numerous imperfections and doubts attaching to the observations above reported. But as it happens to be the very first instance in which facts bearing at all in the direction of the late Dr. Austin Flint's now well-known thesis in respect to the pre-systolic murmur have occurred to me, and as Dr.

Byrom Bramwell has recently contributed to this JOURNAL for March, 1888, another exceptional case presumably of the same or similar order, I regard it as simply a matter of duty to avoid the implication that any important observation, apparently opposed to the current theory of mitral stenosis and its murmur, will be on this account suppressed. At the same time it is surely not unbecoming to emphasize the fact, that Dr. Bramwell's case, observed in October, 1886, and the present one, are actually, I believe, the only contributions hitherto from the European side of the Atlantic to the theory in question, viz., that a characteristic pre-systolic murmur, such as in most cases accompanies mitral stenosis, may be produced without disease of the mitral orifice, when there is present exceedingly free regurgitation through the aortic valves.

Dr. Bramwell's case, though very striking and up to a certain point convincing as to its clinical features, is deficient, considered as evidence, from the want of a post-mortem examination. The present case, on the other hand, is one in which the clinical evidence fails to come up to the standard of precision, while the post-mortem results are such as, with better and more secure clinical data, might be accepted as conclusive. The two cases taken together show that the apparent corroborations of Dr. Flint's theory are probably few and far between. This is not by any means a legitimate reason for setting aside the theory or the facts adduced in support of it. But it is a reason for suspense of judgment until the multiplication of unquestionable facts in the experience of competent observers has allowed of the question being looked at all round, as it were, instead of merely as one involving the authority, high as it is, of one distinguished man.

As the matter stands at present, Dr. Flint's first case was observed in May, 1860, and his second in February, 1861. There is then a long pause, and no other case appears to have occurred to him for more than twenty years. Another case, however, in America is alluded to in a footnote in the posthumous edition of Dr. Flint's *Principles and Practice of Medicine*; and yet another recent case is quoted by Dr. Bramwell from the *Transactions of the Association of American Physicians*. These are, so far as known to me at present, all the materials available in print for the consideration of this subject.

Dr. Flint's theory, reduced to its simplest possible expression, is that when the ventricle is prematurely filled, and over-filled, during the diastole, owing to free regurgitation through the aortic valves, the mitral curtains are floated up, mechanically, so as to lie athwart the auriculo-ventricular opening, and to close it; and that the auricular contraction, coming later in sequence, surprises (so to speak) the valves in this abnormal position, and the current of blood thus established from the auricle thrusts them back again so as to give rise to "a blubbering murmur." The murmur is not, therefore, one of mitral stenosis, inasmuch

as the opening is not diseased in any way; but it is, nevertheless, one arising out of mechanical conditions closely allied to mitral stenosis, and as regards their momentary physical and acoustic result, identical with it. Dr. Flint is himself most careful to point out that the theory as now given is in no degree opposed to the current theory of the murmur of mitral stenosis, which still remains intact as the explanation of all but a very few cases. Indeed, the supporters of the current theory have every reason to regard Dr. Flint's view, should it be finally established, as a crowning proof that the murmur in question, quâ the mitral orifice at least, is a *direct*, and not a *regurgitant*, murmur.

But can Dr. Flint's view be regarded as established on the basis of the evidence hitherto produced? It is difficult, I admit, to withstand the force of conviction implied in the statements made in his last article on the subject, and reproduced in Dr. Bramwell's paper already referred to. But knowing as I do the numerous fallacies which beset the observation of such murmurs, and which dictated the cautious wording of the reports in detail in the case above recorded, I feel bound to add that I am still unconvinced. Indeed, I have at present occasional opportunities of seeing a case which very clearly illustrates these difficulties, and which is in some respects the converse of Dr. Byrom Bramwell's case.

The patient is a laboring man who has been in the hospitals both of Edinburgh and Glasgow. In the Royal Infirmary of Edinburgh he was most carefully examined, and held to be a case of aortic disease (obstruction and regurgitation). The opinion I formed of the case, on the other hand, was that it is *mainly* one of mitral stenosis; though not excluding the possibility, or probability, of aortic disease also. The details on which the Edinburgh opinion was founded were placed in my hands, and it is impossible not to feel that the case is one which might possibly corroborate Dr. Flint, although in the meantime I adhere to the diagnosis above expressed. Dr. Byrom Bramwell lately saw this case with me, and, I believe, agrees with me in general terms about it. Were there to be found *no* mitral obstruction in this case, it would go far to carry Dr. Flint's conclusion.¹

Dr. Bramwell has placed on record a difficulty in the way of adopting Dr. Flint's theory, which is the very great frequency of free aortic regurgitation as compared with the rare occurrence of it in connection with the auriculo-systolic murmur. He quotes Dr. Guitéras, of Charleston, S. C., as having stated, in recording a case of this kind, that he believes "that obstructive functional mitral murmurs are of frequent occurrence in aortic regurgitation;" but in this opinion I apprehend that Dr. Guitéras

¹ Careful diagrams of the murmurs in this case, as heard by several ears on different occasions, have been preserved, but in the absence of further evidence as to the facts it does not seem necessary to reproduce them here.

stands almost alone. Dr. Bramwell, however, holds with Dr. Guit  ras (having adopted it, however, as an independent opinion at first), that such murmurs may be more apt to develop when the posterior aortic segment is affected, because in such cases the regurgitant stream is brought to bear directly against the anterior leaflet of the mitral valve.

ON THE FORMATION OF SECONDARY GROWTHS IN CARCINOMA.¹

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BEFORE speaking of the formation of secondary growths, it is necessary to classify the different forms of carcinoma, and in doing so I shall deviate a little from the arrangement usually adopted.

1st. There are those cancers derived from epithelium which exists in the body for the protection of surfaces, such as the stratified squamous epithelium of the epidermis,   sophagus, and tongue. That is, from epithelium the function of which is not to secrete, but is mechanical.

2d. Those cancers derived from epithelium which lines simple secretory glands, such as those of the pylorus and the glands of the rectum. That is columnar epithelium, whose function, at any rate in the rectum, is to secrete mucus; its function in the pylorus is not yet proved.

3d. Cancers derived from epithelium which forms the parenchyma of the true secreting glands.

In the squamous epithelial cancers the process by which a new growth is formed is a comparatively simple one. Taking the normal epidermis as an example, the lower layers of epithelium project downward between the papill  e of the cutis vera and form the interpapillary processes, the lower layer of the cells being of a more or less columnar form and joined to the cutis by a stratum of cement substance.

An ordinary irritation causes hypertrophy of the epithelium always in the direction of the surface, and results in a corn or wart.

In the formation of a cancer the process is exactly the opposite; the growth takes place in a downward direction, and the columns of epithelial cells grow into the cutis vera. As these columns grow they send out processes composed of similar cells in various directions, and in making a section of the growth a column of cells cut in its longitudinal diameter will often be found having a concentric arrangement of cells in it—the so-called epithelial nests. The explanation of these nests is this: the section passes through the long diameter of a column having

¹ Read before the Michigan State Medical Society, May 9, 1889.

a secondary column growing from it at right angles; this secondary column is consequently cut transversely and gives this concentric arrangement of cells. Precisely the same thing may be seen where a column itself has been cut transversely. The cells in the centre of the nest are those corresponding to the upper layer or stratum corneum of the epidermis. In many epitheliomata these cells have undergone a horny degeneration.

The columns get smaller as they grow downward, and finally become separated into single cells, and groups of two or three cells. In this state it is easy for a cell to pass into one of the lymphatic spaces in the connective tissue, and in this way get carried by the lymph stream into the blood. In this variety of carcinoma the whole process is a slow one, and it is rare to find a growth, removed by operation, that has arrived at this final stage.

The second division of carcinoma, that commonly called columnar epithelioma, is one of which I shall say very little in this paper. It is a difficult problem, and I think will require much further investigation before anything definite can be said about it. I have now two cases under observation which have completely upset all the conclusions I had formed on this subject. In a case where I was consulted last year, a narrow circle of rectal mucous membrane was altered, by what was practically hypertrophy of the Lieberkuhn glands; this had resulted in ulceration and hemorrhage. A circular portion of the gut was removed, and the recovery has been complete with no discomfort or recurrence. Other cases, however, present features that differ very much from this.

The third variety, or glandular carcinoma, is far more important, occurring, as it does, in organs where in many cases removal is impossible, and reproducing itself by secondary growths throughout the body. The two forms in which this cancer appears—scirrhus and encephaloid—are determined by the rapidity with which the neoplasm grows; if the growth is slow a large amount of fibrous stroma is formed, and the cells are relatively few, a hard cancer or scirrhus is the result; if the growth is rapid, the cells preponderate and are larger, and a soft encephaloid cancer is formed. Many growths show various grades between these two extremes.

I will take the mammary gland as an example of the manner in which a cancer is formed and secondary growths produced from it. This is a compound tubular gland composed of ducts and acini, the acini are lined by short columnar cells placed on a basement membrane, the secretion of the gland is formed by the protoplasm of these cells, from material brought to them by the blood, in the same manner as in any other secreting gland. It is not formed by the fatty degeneration of the cells, as stated in most of the text-books on pathology. A healthy gland of this description is subjected to some malign influence, of which we know

nothing, and the result is, these secreting cells begin to germinate and in a short time increase in number, so that they fill and distend the acini; at the same time the normal fibrous connective tissue of the gland also grows out among these cells, so that it forms a stroma of a reticular character, which encloses the cells in its meshes, the whole soon extends beyond the boundaries of the acini, and the compound tubular gland becomes transformed into a neoplastic growth, composed of a reticular fibrous stroma, having masses of cells of epithelial type in its interstices.

It seems to me that whatever the influence may be which first starts the growth in the cells, it must, to a certain extent, act on the fibrous tissue also; the mere irritation caused by the germination of the secreting cells is hardly sufficient to account for the rapid increase of the stroma. Another important point is this: these newly formed cells are derived from cells which had the power, by virtue of their protoplasm, of taking some materials from the blood and forming from them some substance which was the secretion of the glands in which they were placed. Is it not probable that these new cells may retain to some extent this property, and that the secretion they form may, under these altered conditions, be one which can exert a noxious influence on the body; in this way the cachexia of cancer may be partly explained. It seems to me that altered chemical conditions play a more important part in diseases than we are aware at present.

To understand how a growth such as I have described can readily reproduce itself in the nearest lymphatic gland it is necessary to study the arrangement of its component parts. The cells are in masses continuous throughout the interstices of the fibrous stroma. The bloodvessels run in the fibrous stroma, and are not in contact with the cells. The stroma consists of white fibrous tissue, arranged in the usual manner, the fibrils forming minute bundles or fasciculi, and they are interlaced or felted, leaving spaces between the bundles; these are the interfascicular lymph spaces, which are filled with lymph, and are in direct communication with the lymphatic vessels. Now the cancer cells lie in actual contact with the stroma, consequently it is an easy matter for a cell, possessing, as it probably does, a certain amount of amœboid movement, to pass into one of these interfascicular lymph spaces. The current here being always from the periphery, they pass along until they reach a lymphatic capillary; these all having valves, the course of the cell is determined, and in a short time it reaches the nearest lymphatic gland.

To enable one to study the changes that take place in a lymphatic gland, on the introduction of a cancer cell, it is necessary to examine these glands where the process has not advanced very far, and I have been fortunate enough to obtain several cases in this condition. In some of these the axillary glands were neither enlarged nor hard, and could not be felt before the operation.

On examining a gland the seat of cancerous invasion under the microscope, three distinct forms of cells can be made out:

1st. The normal lymph-cells.

2d. Large cells with well-marked nuclei and showing very plainly the intracellular network.

3d. Large masses of homogeneous material containing many irregularly shaped nuclei—that is, multinucleated cells.

The lymph-cells are apparently unaltered. The large cells correspond to those in the primary growth, and show a marked difference in the manner they stain with logwood, to that of the normal lymph-cells—these stain deeply while the cancer cells take the stain faintly. The large multinucleated cells also stain deeply with logwood. These differences induced me to try multiple staining, and in this way I was able to make out the relation of these cells to each other. I used picrocarmine to stain the connective tissues, rosanilin sulphate with iodine green for the cells. I found the normal lymph-cells stained a bluish-green, probably a combination of the last two colors. The cancer-cells stained a pure green. The large multinucleated cells stained purple. I was able to make out that these two forms had no relation to the first, but were cancer cells in the active and resting stages. I found that in some of the multinucleated cells, small masses of protoplasm were becoming separated; these small portions invariably contained a nucleus, and showed the intra-nuclear network, and in every case they were stained green like the single cancer cells, and not purple like the mass from which they had separated. On examining the multinucleated cells with a high power, I found that the majority of the nuclei were irregular in outline and stained deeply with purple, but here and there I found one more rounded in outline, and these had stained faintly with the green; these were gradually becoming differentiated from the mass. I have not time to go fully into all the investigations I have made, but the results I have obtained are these:

A cancer cell reaching a lymphatic gland divides and forms one of these multinucleated masses; after a time one of these nuclei becomes separated from the mass and forms an independent cell in the resting stage, after this it becomes active, germinates, and produces another multinucleated cell. And, further, the chemical reaction is different in these two stages, as shown by the affinity of one for the green stain, the other for the purple. While this process is going on the fibrous stroma is increasing, and ultimately all traces of the normal structure are lost, the gland then becomes irregularly increased in size and hard. I have found these changes in every case I have examined of cancer of the breast, and I have also found the same appearances and reactions in secondary cancer of the liver and other organs.

I have never seen anything to justify the view that the cancer cell

can exert an influence on a connective-tissue cell, and cause it to form epithelial cells—the so-called spermatic influence. It has been considered that in secondary infection of lymphatic glands, those in the chain nearest to the primary growth would be completely changed into cancerous tissue before those further off were involved in the process.

A case of cancer of the mammary gland, where I was called in consultation recently, disproves this. I found two of the pectoral glands slightly enlarged and rather hard, but could not feel any gland whatever in the axilla. At the operation the mammary gland and the contents of the axilla were removed. I dissected out all the glands and kept them separately. I found on examination that about three-quarters of each pectoral gland was changed into cancerous tissue, the remainder being normal; while in the upper axillary gland about one-fourth of its substance was cancerous tissue, the rest normal.

This surely points to the early removal of the axillary glands in cases of cancer of the breast.

AUTO-ELIMINATION OF AN ABDOMINAL TUMOR THROUGH AN EXPLORATORY INCISION.

BY HENRY MCNAUGHTON, M.D.,

OF ERIN, ONTARIO.

MRS. C., aged twenty-eight, has a good family history, and is the mother of two healthy children. She made a good recovery from the last accouchement, which occurred on March 19, 1886, and was able to nurse her child.

At that time my attention was called to a tumor which occupied the left and central part of the abdomen. It was of a flattened pyriform shape, about ten inches long and six inches broad, its long axis being at right angles to the spinal column. It occupied the umbilical and left lumbar regions. It was smooth and elastic, and enjoyed a wide range of mobility. Without giving her pain, it could be pressed into the right iliac fossa or upward under the liver; it could be rotated on its axis nearly one hundred degrees, but this movement caused a sharp pain and some sickness. She informs me that she could feel the lump ever since childhood, and that it has been slowly increasing in size; but her general health continued very good, and up to this time there were no symptoms that could be referred to the tumor.

Early in September, 1887, she complained of sharp pain in the abdomen, and had a good deal of sickness and high fever, which disappeared after a few days' rest in bed.

In January, 1888, it was very evident that the tumor was rapidly increasing in size. The abdominal measurement at the umbilicus was thirty-five inches. The dulness now extended to the right as far as the ascending colon. There were œdema and pain in the left leg, and some swelling of the inguinal glands of that side. The abdominal pain had

now become severe and persistent. Her evening temperature was 102°, with a slight morning remission. Her appetite failed and she emaciated rapidly. The skin of the whole body assumed a yellow tinge. The tumor could not now be moved about, having become adherent to the abdominal wall. She was forced to keep the dorsal position.

After careful consideration and consultation, it was decided that an exploratory incision should be made with a view to the removal of the tumor if found practicable. On the 22d of March, with the assistance of Drs. McKinnon and Howitt, the peritoneal cavity was opened by a median incision about four inches long. When exposed the tumor presented a very bluish appearance, as if gorged with venous blood. It felt spongy to the touch; its whole anterior surface was firmly adherent to the abdominal wall. On breaking down some of these adhesions, on either side of the incision the hemorrhage was very free. A hypodermic needle was inserted into the tumor in several places, but nothing was withdrawn except dark blood. Having concluded that the safe removal of this vascular mass was impossible, the incision was closed and the ordinary dressings applied. The fever, dyspnoea, and emaciation continued, but the pain was much less severe than before the operation. Primary union occurred in the wound, but on the 20th of April it re-opened, giving exit to a free discharge of thin dark-colored pus. The discharge of pus and broken-down fragments, some of them quite large, continued with brief periods of intermission until the 1st of October. It ceased definitely about the middle of October. During this period the area of dulness and the size of the abdomen slowly diminished, and the general condition of the patient gradually improved; the œdema disappeared from the leg and the fever subsided.

January 1. Her health seems now to be fully established; pulse 82; respiration 16. The renal function is normal and her appetite is good. Her weight is three pounds more than before her illness. The skin has regained a healthy color and the muscles are firm; in fact, the cicatrix is the only trace remaining of the long illness that she had. The abdominal circumference at the umbilicus is now twenty-five inches. Regarding the nature of this tumor two medical men in good standing, who saw the patient several years before her late illness, told her she had a movable spleen. At the time the exploratory incision was made, all the medical men present looked upon the tumor as an enlarged spleen. In support of this view I may refer to the situation of the tumor, its form, its appearance, and its feeling to the touch when exposed. Besides, though the patient has been repeatedly examined since her recovery, no splenic dulness can be made out, there being nothing in the situation of the spleen but a small, hard mass. On these grounds, though no proper microscopical examination was made, I think there can be no reasonable doubt that this tumor was an enlarged movable spleen, the very free range of mobility being due to the length of its pedicle. It may also be reasonably concluded that the first step in the production of the acute symptoms was *twisting of the pedicle*; the rapid increase in size; the acute congestion found when the exploratory incision was made; the numerous adhesions, and the subsequent destruction of the organ as noted in the history given, would naturally follow from the gradual strangulation of the circulation in the pedicle.

The experience met with in this case furnishes a strong argument in favor of early operation in cases of wandering spleen. The very fact of

the organ wandering about is proof that its pedicle is long; and when there is a long pedicle, it is not improbable that in course of time the tumor may become so rotated on its axis as to affect its blood-supply very seriously, or even to arrest it altogether. It is well known that this occurs in some cases of ovarian tumors, and accounts for the development of acute symptoms of a very urgent character. It is in these cases that immediate operation becomes necessary to save life. Ordinarily in cases of wandering spleen no operation is performed unless it produces some constitutional disturbance.

In view of the comparative simplicity and safety of an early operation, and of the other fact, that this wandering spleen, from twisting of its pedicle, may quickly place the patient's life in peril, would it not be in the interest of the patient to advise early excision? This is the recognized practice in all ovarian tumors, and the change from the old plan of waiting till some constitutional disturbance arose, accounts in some degree for the small mortality in ovariectomy in comparison with the results obtained twenty years ago. Now every operator, as soon as his diagnosis is made, proceeds to remove the tumor; he finds no adhesions, and almost every case recovers. This patient, with nothing but a small indurated mass in the left umbilical region, is in better health than she was with her wandering spleen. From the fact that many persons regain excellent health after the excision of the spleen, it is clear that the organ is not essential to life. From this point of view, therefore, there is no reason why it should not be treated the same as a cystic ovary.

The recovery of this patient from so grave a condition, and in the manner related, is without parallel in the annals of surgery. The attempt at removal was not made. On making the exploratory incision, the state of matters disclosed left no doubt that the patient would die on the table if excision were proceeded with; but nature rescued the patient by using the tract of the incision as a channel by which to eliminate the pus and broken-down fragments of the gangrenous spleen from the system.

CURE OF THE FALSETTO VOICE.¹

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AT puberty, voice in the man, as every one knows, undergoes a remarkable change. Its timbre and intensity may remain the same, but its pitch becomes much lowered; the puerile becomes masculine.

¹ Read before the American Laryngological Society, September, 1888.

In some this change occurs quite suddenly, in more the transformation is gradual, but in a very few, though puberty be fully established, the voice remains unaltered, or, more usually, its pitch becomes higher—reaches the falsetto; the boy is man in everything but his voice.

Very frequently this condition undergoes spontaneous cure. At a period of uncertain length after puberty—it may be months, it may be years—the lad in some vocal effort, hitherto untried, finds that the voice of a man issues from his chest. He repeats the experiment, and the heretofore unused, or misused, muscles which control the lower register, having once felt the stimulus of action, automatically respond to future exigencies.

More rarely—indeed, this condition is quite a rare one—this falsetto voice persists beyond the second into the third decade when social and business interests begin to cluster about the man, and his condition is made a very humiliating one.

Until recently I was under the impression that every laryngologist was familiar with this anomaly and its cure, but the history related me by my last patient, of various attempts made in this direction, convinced me that I need not apologize for the introduction of the subject at this meeting, further fortified by the fact that, within my knowledge, the theme has received but little attention in literature.

Mr. S. G. F., banker's clerk, aged twenty-five, until within sixteen months a resident of Washington, D. C., but for the period mentioned an inhabitant of St. Louis, consulted me with regard to an infirmity of the voice in November, 1887. His statement, made in quite a high falsetto key, revealed the fact that he had never yet talked in any other manner, with the following exception: He had occasionally rendered monosyllabic imitations of his brother's deep basso voice, but had been warned to avoid this, for fear of injury to the vocal apparatus.¹ He had never yet uttered a complete sentence in other than his present squeaking, puerile voice. He felt sure that his voice was of higher pitch than previous to puberty.

There existed a partial, not a literal, exception to this latter assertion. Direct questioning elicited the important and instructive fact that, in laughing, the voice was of low pitch, as in other men. He had quite given up hope of relief, inasmuch as a specialist of repute at his own home, having unsuccessfully treated him during several months, had then called in consultation a veteran and distinguished laryngologist from another city, who could, however, suggest no other therapeutic measure than the one already chiefly employed, namely, electricity. He had further consulted another laryngologist in a large Eastern city without avail. He was told uniformly that the trouble was of paralytic nature, and given an unfavorable prognosis.

Instrumental examination revealed a condition, crudely speaking, of perfect health of the upper air-passages. He was in all other respects a normal individual, including his genital organs. It is matter of common knowledge that boys who have been castrated—the eunuchs of the East

¹ Nature asserted itself, but was promptly suppressed.

—maintain their puerile voices after the age of puberty, and it has been written that as late as in the last century choir boys with fine voices suffered castration that their high tenor or falsetto voices might remain unchanged after puberty to serve in the choirs of cloistered orders of monks. The general public, acquainted with these facts, is prone to consider that a full-grown man with a falsetto voice must be lacking in genital development. One of my patients insisted on proving to me that he was not deficient in this respect. I need not say that the public is entirely wrong in the suspicion.¹

Observation with the laryngoscope proved in the patient in question that, far from there being any paretic condition present, the true and false cords during phonation approximated more closely than they should have done; an observation proven by comparison in the same individual a few moments later, when his falsetto voice had given way to a normal baritone. It could then be readily seen that the vocal chink was now much larger; that the whole larynx was lacking in the element of muscular tenseness which had characterized the vocal attitude of the falsetto voice. The patient was told with an air of confident authority, after careful and prolonged laryngoscopic examination, that his vocal apparatus was in a condition of perfect health; that the error was purely physiological, and consisted in the faulty use of his voice, and that he would leave the consulting room cured of his falsetto tones. This information was given in this confident manner that it might carry conviction; that it might stimulate the nerve element involved to a correct performance of function.

The chin of the patient was now depressed on the sternum, this being done for its mental effect rather than to relax tension or depress the larynx; and whilst in this position I uttered a low guttural, and asked the patient to imitate me, which he at once did. His attention was then drawn to the fact that he *could* utter low tones. His head being again depressed, he at once readily imitated my low tones in counting. A conversation ensued, his confidence was established, and the cure almost accomplished. The patient must, however, be assured that his newly acquired voice is proper to him, for at first he can scarcely believe that the unfamiliar tones form his normal voice.

In a word, the remedy consists in telling the patient that he has a normal voice, and, by some device, proving it to him. For the first few days, unless the patient fixes his attention on each vocal effort, he is apt to commence a sentence in his former falsetto key.

My patient was, therefore, requested to remain at his lodgings for two days to escape business diversions, and concentrate his attention on his voice; to practise speaking and reading aloud. At the end of this time he found that, even when his mind was diverted from his voice, that he spoke quite naturally. At the end of three months, on being requested to speak in his former falsetto key, he found himself utterly unable to do so.

¹ The matter is embarrassing to the patient, who is conscious that the public suspect him to be a eunuch.

I have thus far had three cases, their history and cure being similar. In my first case, occurring fourteen years ago, I noticed that the individual spoke in falsetto tones, but laughed in quite natural ones, and it was the clew to my successful theory and treatment. It occurred to me that laughing was a natural act, articulate speech an artificial one, the product of imitation and training. It therefore suggested itself to me that the artificial tone of speech could be trained to imitate the natural one of laughter.

The muscles at physiological fault are undoubtedly the thyro-arytenoids, from the physiological fact that they are the internal tensors of the larynx, and from the clinical fact that in my cases the ellipse between the cords during vocalization was much larger after restoration of the normal voice.

This belief is further strengthened by laryngoscopic observations in a *totally opposite* class of cases, to which also—indeed little, if any—attention has been made by authors, namely, paralysis of the thyro-arytenoids in adults, *caused by excessive use of the high register before puberty*.

I have been consulted by two gentlemen for voice troubles whose history was identical. In both, direct questioning drew forth the history that there had been habitually excessive use of the high register for two or three years before puberty; in the one case in singing, and in the other in elocution. At puberty both found their voices changed, to become husky, very deep, rough, incapable of maintaining so long a sentence, without inspiring, as before puberty, so aptly termed phonative waste of breath, and both unable, with any effort, to reach a note higher than the middle register of a baritone.

Their ages at the time of observation were, respectively, twenty-seven and thirty-two. Their voices had undergone no change from the one into which they passed at puberty. In both the vocal ellipse was very large, the sickle shape of the cords during phonation being well marked. There existed the well-known clinical picture of paralysis of the thyro-arytenoidei.

My purpose in mentioning this class of cases is to offer the conclusion that if, in the one, the subjective and objective signs collectively be the exact antithesis of those in the other, and it be admitted that in the one paralysis of the thyro-arytenoids be the exact diagnosis, hyper-tension of the same muscles must be chiefly concerned in the emission of the falsetto voice.

A CASE OF SYPHILIS IN WHICH SEVERAL FINGERS OF
BOTH HANDS BECAME COLD AND LIVID;
SUSPECTED ARTERITIS.

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DERMATOLOGICAL ASSOCIATION.

THE title of this paper has been adopted from one published by Mr. Jonathan Hutchinson, of London, in 1884 (*Medical Times and Gaz.*, 1884, i. p. 347). The close resemblance which my case bears to that of Mr. Hutchinson will, I believe, justify its adoption.

John W., twenty-five years of age, born in New York, a butcher by trade, applied for treatment at the German Dispensary on February 28, 1889, and gave the following history: He had a chancre about three years ago. As soon as it was healed, he got ulcers on the back, of which large scars remain. He took medicine until all the ulcers were healed up, but none afterward. In February, 1889, ulcers broke out again on the back, penis, nose, and scalp, and are still present, showing unmistakably a syphilitic character. Besides, he complains of an affection of several fingers of both hands.

About a month ago he noticed that the tip of the right fifth finger was white and somewhat shrivelled in the morning. After three days the finger became blue and very painful near the tip. The pain was spontaneous—not increased by touch or pressure; it lasted day and night, and was so severe as to prevent the patient from sleeping. After a few days the pain decreased, the tip of the finger remained blue and showed a thickening of the skin under the free border of the nail. The fourth finger of the same hand became white soon after the fifth, and within a few days, without causing any pain, assumed the same bluish color, and, like the fifth, began to feel cold and to look shrivelled, particularly in the morning. A few days later the third and fifth of the left hand underwent similar changes, and about a week ago the fourth finger of the same hand in its turn became affected. In the morning the blue color is particularly distinct, the affected fingers are shrivelled, feel cold and somewhat numb, as if they had been exposed to severe cold; after rubbing them for a while, the sensation of numbness ceases almost entirely.

On examination I found the fourth and fifth fingers of the right hand of a decidedly bluish, somewhat mottled appearance, and distinctly colder than the other three fingers, which presented a perfectly natural appearance. On the affected fingers the free border of the nails appears remarkably white; next to the free border a zone of fine reddish streaks surrounds the nail, which looks dark blue like the entire distal phalanx. This color extends over the whole finger, diminishing in intensity toward the knuckles. The fingers are not tender to the touch or to pressure. In the centre of the tip, close to the nail, on the fifth finger the epidermis over a well-defined spot, about the size of a silver five-cent piece, is thickened, the surface being brittle and slightly scaling. The fourth finger exhibits nearly the same condition, the thickening of the epidermis

only being less pronounced. The other fingers and the hand itself do not show any change of color or temperature.

A similar condition is observed on the third, fourth, and fifth fingers of the left hand, the fourth being somewhat less affected than the two others. There is the same livid mottled color, the whiteness of the free border of the nails, the zone of bluish-reddish streaks around the fixed part of the nails, the blue color being most pronounced at the distal phalanx, but extending as far as the knuckles, and there is the same coldness. There is no clubbing of the end of either finger. Touching or pressing the fingers does not cause any pain.

On both wrists the pulse can be distinctly felt, the radial as well as the ulnar, the latter, naturally, somewhat less distinctly. Neither at the fingers, the hands nor arms can a thickened bloodvessel be felt.

At the next visit of the patient, March 5th, all pain in the fingers had disappeared, but otherwise there was no change in their condition, only that the thickened epidermis at the tip of the right fifth finger had dropped off in the shape of a dry, thick scale, leaving a healthy surface, and that a slight thickening of the epidermis of the tip of the left middle finger had manifested itself. The ulcers on the back and elsewhere showed a healthy condition and were beginning to heal. The treatment inaugurated on the first visit, the biniodide of mercury with iodide of potassium internally, and mercurial plaster locally, was continued.

The patient again put in appearance on March 19th, having neglected to take his medicine regularly, and having indulged in drinking beer freely. The former ulcers were almost healed, but some new pustules had appeared on the scalp, face, and chest. The affected fingers still presented the same conditions; bluish color, some shrivelling of the tips and coldness. The thickening of the epidermis of the right fourth and third left fingers has fallen off, leaving a slightly depressed but healthy surface.

On April 16th, after several weeks of continued treatment, not only were all the ulcers healed except one over the right eyebrow, which presented a healthy granulating surface, but the affected fingers had resumed their normal appearance and temperature. The patient says that in the morning they still feel slightly cold for a while, and that in lower temperature they become more easily blue and cold than the unaffected ones.

Several attempts to measure the difference in temperature between the affected fingers and healthy portions of the hand with the thermometer unfortunately proved futile, owing to the want of precise instruments. The usual medical thermometers do not indicate a temperature as low as that of the affected fingers, which was certainly a good deal less than 91° F. After procuring another thermometer with a lower scale, the temperature of the normal portions changed so rapidly, as soon as the patient entered from the waiting-room, and as soon as the fingers had been handled somewhat, that the results of measuring could not be relied upon. Later on, the rapid improvement in the condition of the patient did not allow of further experiments. So the difference in temperature could only be determined by the hand, but it was sufficient to become evident to every observer.

The subject of Mr. Hutchinson's case was a patient, thirty years of age, in the fourth year of undoubted syphilitic infection. He presented

coldness, lividity, and pain of the fingers of the left hand except the thumb, which at least was but slightly affected. On the ring-finger at its bulb there was a troublesome sore. It consisted of a "subcuticular suppuration with livid edges. It is very tender," says Hutchinson, "but in all other respects resembles those which I have seen on fingers after section of nerve-trunks." There was 10° difference between corresponding parts of the little, middle, and ring-fingers (near their ends) of the two hands; the ends of the left fingers averaging 76° , while those of the right hand were 86° . The pulse at the left wrist was nearly as strong as that at the right, and there was no evidence of occlusion of veins. The ulnar nerve could be easily felt, and was not enlarged on the affected side. The patient complained that it caused more easily pains and tingling when it was pressed on the affected side, than on the other. Under specific treatment after six months the pain had ceased, the temperature of the ring-fingers of the two hands was the same; the affected fingers were much thinner than those of the other hand.

"This case," Mr. Hutchinson says, "was under my observation nearly twenty years ago. I have abstained from publishing it—although in my experience almost unique—because I was quite unable to offer any satisfactory conjecture as regards diagnosis. It was only the other day on reading over the notes again that it occurred to me that the cause of the symptoms must have been inflammatory occlusion of the arteries of the hand. At the time the case was under care, this diagnosis never crossed my mind, and consequently I failed to investigate certain points, which might have confirmed or refuted it, chief amongst these being, of course, the state of the digital vessels and of the ulnar artery. But, at the time, my mind was preoccupied by the hypothesis of nerve cause, to which the severe pain seemed to point. My notes state that the radial pulse was not materially weaker than that of the other wrist, but it will be seen that the symptoms were more marked on the ulnar side. It is, besides, very possible that the arteritis, if such there were, began peripherally, and travelled upward. Possibly it never reached the larger trunks." "It is in part the impossibility," Mr. Hutchinson continues, "of explaining the symptoms on any nerve hypothesis, which induces me now to resort to that of local arterial occlusion. The fingers affected were not those supplied exclusively by any one of the nerve-trunks of the forearm, and there never was any loss of sensation or of motor power, nor were the local changes such as those which we recognize as common in any form of paralysis. They were lividity, coldness, and pain; for the most part indicative rather of disturbance of nutrition and occlusion, than of nervous influence. A certain school of observers will probably claim the case as an instance of disease of the vasomotor system, but, in reply to that, I must allege that we know nothing of the occurrence of such symptoms as were here present, in cases in which the ganglia or trunks of the sympathetic have been proved to be involved in disease, or destroyed by injury."

At the conclusion of his paper, Mr. Hutchinson further says:

"Although the finger-tips never actually went into gangrene, they were very near it. The disease differs from the cases described by Reynaud, under the name of peripheral asphyxia, inasmuch as it did not involve all the digits, and was marked by extreme pain. Since its occurrence I have seen several cases favoring the belief that arteritis may begin in the small peripheral vessels, and may travel to larger trunks. If in this instance it began in the vessels of the middle finger, and spread upward and involved the superficial

palmar arch, the phenomena might be fairly well accounted for. Whether in my case syphilis was the cause may be open to some doubt, since the patient had been for some months under efficient specific treatment, and was just well of all other symptoms."

I have largely quoted from Mr. Hutchinson's paper because most of the deductions made by him from his case may be applied equally well to my own. The symptoms are the same: lividity, coldness, and pain, although the latter in a minor degree. Arteritis beginning in the small peripheral vessels and extending centrally, may well account for them; a narrowing of the vessel without complete occlusion furnishing a sufficient explanation. Whether or not an artery of so small a calibre as the digital artery, affected with arteritis obliterans, must necessarily be accessible to the touch, so that it can be felt as a hard, thickened cord, seems open to doubt. I, therefore, do not believe that the absence of such evidence in Hutchinson's case as well as in mine renders the diagnosis of arteritis inadmissible, while, of course, its presence would scarcely leave room for doubt. There need be less hesitation about assuming the syphilitic origin of the arteritis, if, indeed, there were any, in my case, as other symptoms of the activity of the disease were plainly manifest on the patient.

In a former paper, read before the Section in Dermatology and Syphilography, of the Ninth International Congress at Washington in 1887 (*Transact.*, iv. p. 173, and *New York Medical Journal*, Oct. 8. 1887), I maintained the occurrence of gangrene of the skin in consequence of arteritis obliterans, due to syphilis, as a cause of ulcers. In citing the same paper of Mr. Hutchinson, I stated then that it would require the anatomical proof that changes in an artery, leading to a gangrenous portion of the skin, must actually be shown to exist, in order to establish as an irrefutable fact what I had maintained. Since then an observation has been published which furnishes sufficient proof that a subacute, specific, and syphilitic arteritis of the small arteries of the fingers does exist, travelling from the periphery toward the centre—that is, an ascending arteritis—a paper entitled: "Gangrène spontanée des Doigts par Artérite syphilitique, par le Dr. Baron d'Ornellas" (*Annal. de Dermatol.*, Jan. 1888, p. 35).

The patient who forms the subject of the paper was forty-five years of age, and had had a chancre twenty years ago, which healed without treatment, and was not followed by secondary symptoms. At the time he was examined, however, he presented tertiary syphilitic lesions of the tongue. For six weeks the four fingers of the left hand had constantly felt cold, when the soft parts of the ulnar aspect of the tip of the left middle finger became gangrenous. Along the course of the collateral arteries of the diseased finger hard strings could be distinctly felt, and the radial pulse was found to be considerably weaker than that of the other wrist, although perfectly perceptible. Later on, the radial aspect of the fourth finger became gangrenous, accompanied by considerable pain, particularly at night. Seven weeks after the first attack, which had passed off under treatment with iodide of potassium, with loss of the

pulp of the third and fourth fingers, the same fingers in their entire length again became painful and cold, but in a more aggravated manner. The sensation extended to the lower third of the forearm, and within six days the middle finger became mummified as far as the proximal third of the second phalanx, and the fourth finger as far as the proximal third of the third phalanx. D'Ornellas could establish the entire absence of the arterial pulse in the left radial artery, in the palmar arch, the ulnar, and in the inferior third of the brachial artery, as well as the fact that these vessels were obliterated and indurated, giving the sensation of a hard string. In the middle third of the brachial artery pulsations were rather weak, but in the axillary they were perfectly normal. Under specific treatment the affected fingers healed, but with the loss of the gangrenous portions.

Here we have a clear case of arteritis obliterans in a syphilitic person, affecting first the smaller arteries and later on larger branches, and causing a similar chain of symptoms as found in Hutchinson's and in my case: coldness, pain, and mummifications; lividity is not prominently mentioned, but there can hardly be any doubt that it existed at some time. It may have seemed less significant owing to the early appearance of gangrene, the result of the complete obliteration of the bloodvessels, which in the other cases probably never really took place.

D'Ornellas evidently was not cognizant of Hutchinson's publication, for he says that he never heard anybody speak of such localized arteritis in the extremities, and that Verneuil, Fournier, Duplay, and other eminent physicians assured him that they had never seen a similar case, concurring at the same time with his diagnosis. G. Thibierge, however, in a recently published paper ("Les Lésions artérielles de la Syphilis," *Gaz. d. Hôpit.*, 1889, No. 11), placing Hutchinson's and d'Ornellas's cases together, says: "In other cases lesions, which it seems legitimate to attribute to syphilitic arteritis, produce asphyxia and gangrene of the extremities, closely resembling the type of Reynaud's disease."

I trust that this paper will be accepted as a further contribution to this chapter of the pathology of syphilis.

REVIEWS.

A CLINICAL ATLAS OF SKIN AND VENEREAL DISEASES, INCLUDING DIAGNOSIS, PROGNOSIS, AND TREATMENT. By ROBERT W. TAYLOR, A.M., M.D., Surgeon to Charity Hospital, New York, and to the Department of Venereal and Skin Diseases of the New York Hospital, etc. Illustrated with one hundred and ninety-two figures, many of them life-size, on fifty-eight beautifully colored plates; many large and carefully executed engravings through the text. Parts V. and VI. Diseases of the Skin. Philadelphia: Lea Brothers & Co. 1889.

THE fasciculi of this valuable atlas which were issued from the press before the appearance of the present parts, have already received notice in these pages. Of these now offered for review it may be said in truth, that in point of merit they compare favorably with their predecessors.

But as the work advances to completion, its handsome folios suggest that the usual relation of value between plates and text is here reversed. Ordinarily it is the illustrations that are not only most meritorious but most attractive, while the text is then merely a running commentary on the former. But here Dr. Taylor has done such diligent and conscientious work in the preparation of the text, that under his hand it is growing to be a trustworthy and almost complete compendium of knowledge in cutaneous and venereal literature. It is by no means to be inferred from what precedes, that the plates are not in themselves what they have been heretofore described to be in these pages. Such they surely are. But there are more reproductions than one could wish for; and much of the original work is represented by woodcuts, some of the latter fairly good; others, if not poorly executed, at least of inferior value for the purposes of a diagnostician. There is, however, as has been shown here before, a wide difference in the colored plates; some, for example, those representing herpes zoster, kerion, and erythema circinatum, could scarcely be better finished; others, for example, those illustrating some of the lesions of tinea tricophytina and erythematous lupus, were originally poor representations of the disease, and are in the copy coarsely, and therefore poorly, defined.

To the portraits of the class last named the text often offers the widest contrast. It is lucid, practical, and comprehensive always. The author, to cite details which, after all, convey the best idea of all approaches to best results, even gives space to a consideration of the somewhat odd and rather rarely studied lesions found upon the skin in rheumatism and gout. Here we find a broad departure from the doctrines once warmly advocated and hotly contested in this country and elsewhere upon gouty and rheumatic symptoms in the skin. Nowhere more extensively than in France is it taught that many forms of eczema, psoriasis, and herpes

are manifestations of a so-called arthritic diathesis; that these and other diseases of the skin of wide distribution are evidences of the existence in the blood and tissues of those "ashes of digestion," which are capable also of begetting the articular lesions and muscular distress noted in the several forms of rheumatism and gout.

But our author is in accord with the best and latest conclusions respecting this vexed question, by limiting his description of these manifestations to "ephemeral œdema of the gouty," and "rheumatic cutaneous nodules." Here, surely, is a wide diversion from the views attributing generalized cutaneous disorders of widely varying symptoms to what has been somewhat vaguely termed in this country, "the gouty vice."

It is rather remarkable that the field barely touched upon by our author has not been more exhaustively examined. Heberden's nodes, seen occasionally in men young in years or in middle life, somewhat more often in women of advanced years, situated usually upon the distal phalanges of the digits of both hands and feet, are demonstrably in relation with gout and rheumatism. They differ in one striking particular (which could scarcely be made more impressive in statement than in fact) from the eczemas and herpetic eruptions assigned to the gouty state. This point is, that whereas the nodes to which reference is made are never seen save in those exhibiting other symptoms of gout or rheumatism; the other cutaneous maladies attributed to the same state exist in patients who suffer from no demonstrable lesions of gout or rheumatism, save the skin symptoms assumed to be pathognomonic of such states.

There are a number of other skin lesions seen upon the digits, beside the persistent rheumatic cutaneous nodes of later writers, which are of interest alike to the dermatologist and careful diagnostician. Irrespective of the verrucous, syphilitic, epitheliomatous, and rheumatic or gouty nodules observed on the fingers and toes, there are others the nature of which is obscure. A few, rare indeed, are connected with the small synovial bursæ of the sheaths of the digital tendons, and contain synovial fluid, which escapes often in quantity on puncture of the firm, flattish or pointed, warty growth. Then there is the "anatomical tubercle" (so-called *verruca necrogenica*), or dissecting wart, which has an exceedingly indeterminate pathological position, the very respectability of its old name suggesting its survival of usefulness. It probably belongs to the other verrucous growths upon the digits due to local irritation, as distinguished from the small nodes occurring on the fingers and elsewhere, whether containing or not the sodium and other salts of the urates, which are with little question due chiefly to systemic conditions of the patient in gout, rheumatism, and allied disorders.

Dr. Taylor's atlas may be well commended as an invaluable addition to the library of the general practitioner. As it represents fully the best chromo-lithographic illustrations of skin and venereal diseases in England, France, and Germany, as well as America, it is, of course, indispensable to the collector. The work of the publishers has been such as to insure even elegant results.

J. N. H.

TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By JOHN J. REESE, M.D., Professor of Medical Jurisprudence and Toxicology in the University of Pennsylvania, etc. Second edition, revised and enlarged. 12mo., pp. xv., 646. Philadelphia: P. Blakeston, Son & Co., 1889.

THE favor with which the first edition of this excellent treatise on medical jurisprudence and toxicology was received is sure to be accorded to the second edition which has just issued from the press in neat form after a careful revision of the text and the addition of considerable new matter. The changes and additions which have been made have contributed to the value of the work without materially increasing its bulk.

The author remarks in the preface that he has written this book more particularly to meet the wants of students of legal medicine, and he has, therefore, endeavored to condense in a handy volume all the *essentials* of the science, and to present the various topics in a simple and familiar style, giving greater prominence, of course, to those of the greatest practical importance.

There are numerous able and popular treatises on the subject of medical jurisprudence, but most of these are ponderous volumes, more suitable for reference than for use as text-books. The present volume is compassed within moderate limits, but without slighting the subject in any particular, and is, therefore, well adapted to meet the wants of students of medicine and law.

The inevitable consequence of hasty medical training incident to the too limited courses of study required by many medical colleges, is that collateral and most important branches of study are merely skimmed over or ignored absolutely. Medical jurisprudence is among the branches thus frequently slighted. The disadvantages of neglect of full professional training, especially in the general principles and leading facts of this science, are often keenly realized when the practitioner is called upon to give his evidence before the court and jury in cases coming under his professional care, and involving intricate questions of homicidal, suicidal, or accidental death; of infanticide, drowning, and various other similar cases, which, when they become subjects for legal investigation, depend upon such testimony for their proper elucidation. A due consideration for the public interests as well as a proper regard for professional reputation should actuate the physician to acquaint himself with the leading principles, at least, of this important branch of knowledge.

After defining, in the introductory chapter, the subject of medical jurisprudence, and establishing the importance of a thorough acquaintance with this branch of knowledge, and carefully explaining the rights, duties, and responsibilities of the witness and medical expert, the author proceeds to a consideration of the phenomena and signs of death, of post-mortem examinations, and of the causes producing violent death, exclusive of death by poisoning; these subjects occupying nearly one-third of the volume.

Valuable additions have been made to the chapter on the examination of blood-stains. The possibility of distinguishing between human blood and the blood of one of the lower animals seems to have been established. This result is obtained by the use of very high magnifying powers, which

show a difference between the diameter of the human corpuscle and the corpuscle of ordinary domestic animals. This difference is rendered still more striking by amplification by means of photography. There is still a reluctance on the part of some authorities to admit the validity of such evidence, especially as it may be the turning-point for the conviction or acquittal of the prisoner. But, as Dr. Reese remarks, after due consideration and a careful examination of the results of the most recent observations on this subject, we must express our conviction of the entire reliability of all such expert testimony, provided the examination has been skilfully and carefully made by the use of instruments of proper amplification.

More than one-third of the volume is devoted to an exposition of the subject of toxicology. As poisoning is the most frequent cause of violent death, it is necessary that the symptoms, effects, doses, and modes of detection of poisons should be fully detailed. As might be expected from Dr. Reese's reputation, this part of the work has been executed in an admirable manner. Notwithstanding the great number of subjects required to be presented within a limited space, the task has been accomplished without sacrificing any information of value or detracting from the usefulness of the work by meagreness of description. The results of original experiments have been detailed, notably those undertaken with the object of determining the question of antagonism of certain poisons.

The last third of the volume treats of ptomaines, the medico-legal relations of pregnancy, abortion, infanticide, legitimacy, rape, and insanity; the concluding chapter being devoted to medical malpractice and life insurance.

Ptomaines, which result from the decay of organic matter, bear a striking resemblance to some of the vegetable alkaloids in both their chemical and physiological reactions. Moreover, as these organic poisons are produced by putrefactive changes in the human viscera, these facts may be made use of in defending a criminal charged with poisoning with one of the vegetable alkaloids. With proper precautions, however, the expert will be able to discriminate between the organic poisons and the true alkaloids, as there are certain reactions, both chemical and physiological, in which they materially differ. Dr. Reese has furnished an outline of our present knowledge of this discovery, but those who desire to pursue the study more minutely will do well by consulting Prof. Vaughan's recent work, which is perhaps the most complete treatise yet published on the subject.

The chapter on insanity presents the subject with special reference to its medico-legal relations. It embodies a judicious *résumé* of leading principles culled from the best authorities; and is, therefore, a reliable exponent of the modern treatment of the subject. The classification selected is that of Dr. Ray, which has been received with favor by most alienists.

Since the time when Pinel first directed attention to moral insanity, the distinction between intellectual and moral mania has been accepted by many well-known writers. Other equally eminent authorities have strongly controverted this view, and have denied the existence of moral insanity on the ground that there can be no derangement of the mind without the intellect being affected. Dr. Reese strongly advocates this view. Emotional insanity is often set up as a plea for the excuse of the most atrocious crimes, but unless proof can be produced of previous un-

doubted signs of insanity, this plea should not be allowed as a bar to the punishment of the culprit. While authorities recognize two forms of insanity (the moral and intellectual), it must be remembered that the law holds to but one form, that which affects the intellect.

Dr. Reese strongly adheres to the generally accepted theory that as the brain is the organ through which mental phenomena are manifested, all morbid mental conditions are produced by defect or disease of the brain. He believes that "in every case of true insanity, especially in the chronic form of the disorder, there are positive pathological changes in the brain, although these may, at times, be too subtle and recondite to be discovered by our present means of research." This view must not be taken as supporting the idea of the mind being merely a function of the brain; and, therefore, as favoring materialism. On the contrary, it supposes the mind to be a separate, immaterial entity, of which we have no knowledge except through certain physiological media, and the cognizance of non-development, obliteration, impairment, or perversion of one or more of the mental faculties cannot take place, except indirectly, through the abnormal condition of the brain. At the same time, it must be remembered that extensive disease of the brain may exist, the pathological conditions even being similar to those accompanying insanity, without any evidence of this disorder. The reason of this we are not yet able to discern.

The concluding chapters of the work contain a fund of information which will enable the physician to understand better his true professional position in reference to a large class of persons who have been unfortunately deprived of their reason. The duties of the physician in assuming the treatment of cases of insanity, in signing certificates of lunacy, in giving testimony in criminal cases, in determining testamentary capacity, and in furnishing an opinion in reference to the propriety of marriage when the party has been insane, or has an insane heredity, are all clearly set forth.

Chapters on medical malpractice and the medico-legal relations of life insurance conclude the volume.

Prof. Reese's book possesses great merit and is deservedly popular. It is comprehensive in scope, reliable in the statement of principles and facts, and practical in the description and details of professional duties. The present edition, though enlarged, is still sufficiently condensed to maintain the claim as a handy volume containing all the essentials of the science.

The division of the subject into numerous chapters, the full table of contents, and a copious index to facilitate reference, are pleasing features of the book. As a text-book for use in medical schools and for consultation by the professional man, this work may be selected with the most perfect confidence.

W. H. F.

THE INSANE IN FOREIGN COUNTRIES. By WILLIAM P. LEITCHWORTH, President of the New York State Board of Charities. 8vo., pp. 374. New York and London: G. P. Putnam's Sons, 1889.

In the United States it may be assumed that 50,000 insane persons are in the State, corporate, and municipal hospitals; that \$50,000,000 have

been expended on the plant necessary for their care ; and that \$10,000,000 are annually raised by taxation for their maintenance, exclusive of the large amount expended in the construction of county asylums and for the yearly support of the insane in those institutions. The average life of an insane person is fifteen years, and his support will cost his friends or the State the sum of \$3750. The large amount of money raised by taxation for the maintenance of the insane, the proper disposition of those who become a public charge and their varied relations to the State, are social problems involving large public and private interests. They have been the subject of discussion almost exclusively by the physicians and managers of hospitals for the insane, by the medical profession, and occasionally by committees of State Legislatures on the occasion of some special agitation for the creation of a new hospital.

In 1864 the State of Massachusetts created a permanent Board with certain fixed duties and relations to the insane and to hospitals for the insane, which was the first attempt of a State to collect uniform statistics and information for the purpose of establishing some principles and a policy that should govern the care of the insane. Ten States have since followed the example of Massachusetts in establishing State Boards of Charity or Lunacy. The habitual reader of the reports of these bodies might venture to observe that while, as a rule, they show the diligence of their executive officers in compiling statistical information conceded to be valuable, they are not suggestive or leading, and that the Boards have no settled policy to present, but are rather drifting. This may be owing to acknowledged difficulties that surround the whole subject, and, partly, to an unsettled tenure of office, and to frequent changes with the loss of valuable accumulated experience which ought to be retained for the public service. There has existed a lack of knowledge of the best methods of caring for the insane both in this and other countries. With the exception of California and Pennsylvania, in a moderate way, no attempt has been made to form a repository of plans of hospitals. The Government of the United States has neither obtained nor moved to secure information or plans of foreign asylums for the insane which ought to be accessible, and would prove instructive to medical men, to commissions and state officers in search of information about this subject.

Since 1880, no less than thirty medical officers of American asylums for the insane have visited Great Britain and the Continent, generally at their own cost, to observe foreign asylums. Much of the decided improvement in American institutions for the insane that has taken place since that date may be ascribed to ideas and comparisons suggested by enlarged observation. William P. Letchworth became a member of the State Board of Charities of New York in 1873, and since 1878 has been the President of the Board, which office, we now learn with regret, he has resigned. Few persons so gifted by nature with gentle qualities, so endowed with large philanthropy and business sagacity, are called into the public service. An appointment to perform an unrequited and often thankless duty has been to him a call to sacrifice his time and consecrate his means in the discharge of duties calculated to elevate the condition of the poor and lowly, orphan children, and the insane. The volume before us is the "outcome of an investigation of foreign charitable institutions pursued without interruption through seven months" in the year 1881. The contents comprise eight chapters, viz.: Intro-

ductory and Retrospective; England; Scotland; Ireland; Continental Countries; The Colony of Gheel; The Provincial Insane Asylum of Alt-Scherbitz; *Résumé*. The volume contains twenty-one illustrations of former methods of restraint, plans of asylums, and views of interiors; a brief history of the lunacy reform and legislation in England, Scotland, Ireland, and France; together with somewhat detailed descriptions of architecture, plans, interiors of wards, decorations, and daily service; and, with an occasional mild dissent, avoids critical observations, the author being content that his book shall furnish a simple record of what he personally observed. Coming from a trained observer, it will be accepted and consulted as containing a faithful presentation of the institutions visited, as well as a contribution of much-needed knowledge.

Three institutions for the insane: The Colony of Fitz James, Clermont, France; the Colony of Gheel, Belgium; and the Provincial Asylum of Alt-Scherbitz, in Saxony, seem to have excited special interest on account of their marked distinctive features. The first two are successful efforts to provide for a large number of public dependents by a system of colonization, and boarding out among the peasants—but Mr. Letchworth does not think the plan practicable in America as it is carried out at Clermont or at Gheel, although well adapted to the requirements of the communities in which they are located. In another sense both of these asylums are suggestive and furnish useful lessons from which we are likely to profit in America. Both show that the insane can be cared for without costly constructions; that they can be interested in the varied occupations of a large farm and establishment; that a large range of personal liberty can be permitted; and the cost of support be materially reduced. "Of the many asylums for the insane in Europe, there is none more interesting than that of Alt-Scherbitz. Here has been wrought out a system in which are incorporated some of the best and most modern methods of caring for the insane in England, Scotland, France, and other countries." The estate consists of seven hundred acres. The structures are unpretentious, with outer porches, and comprise an administration building, reception stations, observation stations, detention houses, hospital for the sick, etc.—ten in number; and in addition men's villas, women's villas, pavilions for infirm chronic cases, with other appurtenances of a village, as an assembly-room, shops, etc. It is probably a collection of blocks adapted to the requirements of both recent and chronic cases of insanity, and the whole establishment makes a village under the supreme control of a medical director with a staff of four physicians. An entire chapter is devoted to a detailed description of this asylum, which left the most favorable impression upon the author.

Although Mr. Letchworth has devoted much space to a description somewhat in detail of the asylums of Great Britain, he omits to contrast the condition of the insane poor in the well-administered, equipped county asylums he visited with the wretchedness and neglect of the same class which he personally has seen during the past sixteen years in the almshouses of New York. No one of our state asylums can be said to be superior or even equal to the best English and Scotch County Asylums. It is a matter of regret that so little knowledge of them exists from personal observation among those of our citizens in a position to influence public opinion. In this direction this volume must be accepted as a timely contribution. We would do injustice if we did not concede to

our British *confrères* the just meed of praise which is their due for the superior qualities and administration of details of their asylums. We should do greater injustice to the people of Great Britain in this connection did we not refer in admiration and praise to the comprehensive and uniform nature of the system of provision for their insane poor which has been established. It embraces the whole body of the dependent insane, and is in strong contrast to the American system, which, while it makes expensive state provision for a portion, leaves the mass of the helpless insane in county poor-houses, with their changing and various systems and conceded low standard of care. J. B. C.

HUNTERIAN LECTURES ON TENSION AS MET WITH IN SURGICAL PRACTICE; INFLAMMATION OF BONE; CRANIAL AND INTRA-CRANIAL INJURIES. DELIVERED BEFORE THE ROYAL COLLEGE OF SURGEONS IN ENGLAND, JUNE, 1888. By THOMAS BRYANT, F.R.C.S. 8vo., pp. 146. London: J. & A. Churchill, 1888.

THE first of these lectures is devoted to the consideration of the effects of tension in general surgical practice, the word being applied either to the centrifugal pressure brought about by the stretching of tissue over a neoplasm, or by an effusion of fluid, or by the stretching of tissues which have been divided and brought together by sutures. Mr. Bryant illustrates by cases the importance of this factor in producing pain, inflammation, suppuration, and tissue-necrosis; as to all of which points every practical surgeon will agree with him. When, however, he adds that the existence of tension in wounds is a point of such primary importance as to relegate to a secondary position the mode and character of the dressing which is employed, his conclusion is far from being warranted by the premises. The merest glance at the results which have been obtained in wounds of the most severe character brought together without the slightest provision for drainage is convincing evidence that however important a factor tension may be, it is far from occupying the position assigned to it in these lectures. One single case, such as the reviewer saw last summer in the wards of Sir Joseph Lister, would almost carry conviction in regard to this point. A consecutive hemorrhage had followed an operation for the suture of a transverse fracture of the patella. The knee-joint was swollen and distended with blood-clot almost to the point of bursting. Undoubtedly under old methods the accident would have been followed by a suppurative arthritis or gangrene and by the loss of limb or life; as it was, under Lister's admirable antiseptic methods, gradual absorption occurred and the patient recovered with a perfectly useful joint, and without the slightest local inflammatory reaction or the least elevation of temperature.

Mr. Bryant is one of the older surgeons who, through what it seems mild to call excessive conservatism, have opposed from the first the general acceptance and introduction of antiseptic methods. It is curious to note in their writings and teachings the efforts which they make in the face of overwhelming evidence to explain away or otherwise account for the extraordinary results obtained under these methods. The attempt to

give "tension" the chief place among the causes of disturbance in wounds must be set down as an instance of this same spirit, which is the more to be regretted when it is shown by men of the ability and standing of Mr. Bryant.

The second lecture is devoted to tension as seen in inflammation of bone; and in the final lecture the same principles are applied with less directness to the treatment of cranial and intra-cranial injuries.

J. W. W.

PHTHISIE LARYNGÉE. Par le DR. A. GOUGUENHEIM et PAUL TISSIER.

8vo., pp. 339, with woodcuts and colored plates. Paris: G. Masson, 1889.

LARYNGEAL PHTHISIS. By Drs. GOUGUENHEIM and TISSIER, of Paris.

THE recent recognition that tuberculosis of the larynx is frequently curable renders every communication on this disease of intense professional interest. The value of this very thorough treatise of Gouguenheim and Tissier is enhanced by this interest. The clinical studies are summaries and extensions of previous well-known work by Gouguenheim, and the histological studies are chiefly by Tissier; but their combined results are incorporated into the one text.

The volume opens with an historical summary which does not call for any special comment. This is followed by a detailed exposition of the pathological anatomy and histology of the disease; and the succeeding chapters treat of its pathological physiology, its symptomatology, its diagnosis, and its treatment. At the very commencement of the scientific portion of the volume the important fact is prominently stated that dependence upon laryngoscopic inspection alone for recognition of the disease may lead to erroneous conclusions, no matter how skilful the observer. Minute directions are given for the systematic examination of the dead body, both in reference to the immediate autopsy, and in preparation of the morbid structures for further and more minute examination.

Several points of importance have been established by the authors' researches, some of which are confirmative of the observations of Heinze, Mackenzie, and others. Thus it has been determined that tuberculous infiltration may exist without any other lesion, and that ulcerations almost always rest upon infiltrated bases, microscopic inspection of which reveals the infiltration even when, to the unaided eye, it seems absent, especially in certain structures, as the vocal bands. The authors regard the tuberculous infiltration of the mucous membrane as the first stage of the process and not the terminal one. This condition is believed to represent the aryteno-epiglottic œdema described by Sestier. They found that one-third of the subjects dead of pulmonary phthisis present some form of laryngeal infiltration. The infiltration is very rarely localized in any one region of the larynx, and never localized in the epiglottis, which is infiltrated the least frequently. Each region of the larynx and trachea is minutely considered in this connection, and its conditions are compared with the laryngoscopic images and the post-mortem appearances in the normal subject.

Ulceration in the various regions is described in the same order.

Then the subject of polypoid tuberculous vegetations is discussed in considerable detail; forming the first chapter of the kind in a systematic treatise. In a work published by the writer of this notice, in 1872, he presented tables containing a very large proportion of intra-laryngeal growths which he had seen in subjects of phthisis, most of which were reported as papillomas; and he called attention to the divergence of his experience in this respect from that recorded by other writers. Later observation has convinced him that most of those cases were instances of tuberculous tumors such as have been reported occasionally during the present decennium and confirmed as such by detection of the bacillus tuberculosis. He believes with Dr. Gouguenheim, who has paid great attention to this subject, that these growths are often mistaken for ordinary polypi. Our authors allude to their description by Andral in his *cliniques*, and by Mandl in his *Treatise on Diseases of the Larynx*, published in 1872; and they refer to a number of journal articles. When supra-glottic these tumors are ordinarily grouped in the posterior portion of the larynx in unequally lobulated masses, more or less pedunculated, but sometimes sessile. When infra-glottic they are usually grouped anteriorly. Upon the epiglottis they are most frequent at its base or cushion, and may nearly fill the vestibule of the larynx and extend down to the anterior commissure of the glottis. They are sometimes implanted in the ventricles.

Perichondritis is believed to take place in some instances at a period of the disease almost initial. This opinion is based on the facts that tuberculosis is frequently known to be localized in a joint, in a bone, or even in a costal cartilage; and, furthermore, on the fact that in their histological examinations of the tuberculous larynx the authors have frequently found typical granulations comparatively deeply situated, although the surface tissue was normal and the epithelium and its basement membrane unaltered. They therefore regard the majority of the lesions of the cartilage and perichondrium as of bacillary origin.

With reference to tuberculosis of the muscles of the larynx we note a point of original observation. This is an almost constant special yellowish pallor of the posterior crico-arytenoid muscles, especially in patients who die in the advanced stages of the disease. In some instances it has been the only lesion detected, even when it had been thought that important histological alterations would be revealed.

As might be expected from recent papers of Gouguenheim, the subjects of glandular and neurotic complications receives more attention than has been given them by any other writers. In this connection we would call attention to a little known element of danger which has attracted the attention of the authors as one of considerable frequency. This is sudden death by spasm, usually at night, in cases in which there was no apparent reason for expecting such a termination. In an extensive experience of more than twenty-five years' duration, the writer of this notice has seen but a single instance. It may be well, therefore, to quote the authors rather literally on this point. They say "that it is not rare to observe sudden suffocations which are altogether unexpected, and for which the autopsy reveals no other cause than a compression of the nerve, latent up to the fatal moment; that these attacks occur most frequently at night, and carry the patients off with extreme rapidity; and that it has frequently been their lot to find a bed vacant at a morning visit, when nothing had presented the night before to indicate the probability

of such an occurrence." The theories of contracture and paralysis in the domain of the recurrent on pressure of that nerve are discussed in detail, with marked conclusions in favor of contracture as by far the more frequent manifestation.

The sections on morbid histology and on pathological physiology, with those on symptomatology and diagnosis, are very thorough and very reliable. We regret that we must forego their analysis, as well as that of the chapter on acute tuberculosis.

The chapter on therapeutics is confined almost to discussions of topical procedures. The authors have adopted, as an almost routine practice, what is certainly the most effective method for curing the local disease in nearly all instances in which the diseased tissues are accessible to instrumental interference; the general health not being at the same time in such a deplorable condition as to preclude recovery. This consists in energetic frictions with lactic acid as practised by Krause, of Berlin, preceded at times by scraping away the diseased tissue as practised more particularly by Heryng, of Warsaw. Both of these procedures have been sufficiently described from time to time in the abstracts on laryngology in this JOURNAL. The propriety of tracheotomy under certain permanent stenotic conditions is indorsed. Half a dozen pages on general treatment, mainly an exposition of the views of Prof. Sée, complete the volume.

This monograph of Gouguenheim and Tissier is a very thorough and conscientious exposition of the generally accepted views of advanced pathologists and clinicians on the subject of which it treats; and one which, in our estimation, merits the most prominent position in the literature of tuberculosis of the larynx.

J. S. C.

AN ATLAS OF THE PATHOLOGICAL ANATOMY OF THE LUNGS. By WILSON FOX, M.D., F.R.C.P., Holme Professor of Clinical Medicine in University College, etc. Quarto, pp. 386 (with 45 unnumbered pages of plates). London: J. & A. Churchill, 1888.

THIS monument of the late Dr. Fox consists of much more than a mere atlas. It is more nearly to be described as a treatise on the normal and pathological anatomy and histology of the lungs, with a collection of cases, and with an atlas of their post-mortem appearances.

We have called this work a monument, and it is truly monumental—and a worthy one of his labors in this field; and it carries an inscription of his valuable work that will continue to be read as one of the medical classics of the world's library. It appears from the preface that this volume is but one of two books, both on lung diseases, which he left at his death nearly completed to be published by a personal friend. This work is, and the other is to be, published substantially as they came from Dr. Fox's pen.

The opening chapter gives the minute anatomy of the bronchi and lung; and it contains the most comprehensive and accurate description of these complicated structures with which we are acquainted. The account claims to be only a compilation, but it is thorough and complete

and most lucidly set forth. Then follow the chapters, or rather sections, on the pneumonias of the various forms, induration, collapse, emphysema, embolism, and gangrene, and also syphilis and cancer of the lungs; to these subjects only sixty-four pages of the text are devoted. Necessarily in this space full exemplification of these diseases cannot be made, but they have been put in such manner as to help in the study and explanation of the more difficult questions of phthisis.

To phthisis and the artificial production of tubercle, the larger part of the atlas, its text, its cases and the illustrations, both the gross and microscopic pictures, are devoted. Most carefully and most distinctly is given the description of various appearances and condition of the lung and adnexa in phthisis as found in its different forms—the granulations, the infiltrations, the indurations, the cavities. The history, with abundant bibliography, of the recognition of these morbid conditions by all the prominent observers, is furnished, and Dr. Fox's critical remarks and the comparisons with his own work, form the most complete, yet withal brief description of the pathological anatomy of phthisis pulmonalis that has so far been written. Very great value is added to the histological descriptions and delineations by the fact that they have been made from cases of which the author furnishes the clinical histories, and the colored drawing of the gross appearances of the organ.

Dr. Fox's account of the artificial production of tubercle has not the same value as the other portions of the work. It is very interesting and valuable to hear his account of his change of views on the results of inoculations, and the specific nature of the inoculated materials. His earlier observations in 1868, following Villemin's by two years, combated the specific character of the disease, and it is curious to note on what grounds, according to his own statement, he abandoned the very positive results which he had expressed previously. In describing the histological appearances, Fox confuses and fails to indicate clearly the marked differences found in the results of inoculations with pure cultures and those produced, for example, with tuberculous sputum, or those occurring in naturally acquired tuberculosis.

Too much praise cannot be given to the industry and clear perception of facts which enabled the late Wilson Fox to write this half of his work on Diseases of Lungs.

M. L.

DIE METHODEN DER BAKTERIEN-FORSCHUNG. Von DR. MED. FERDINAND HUEPPE, Docent der Hygiene und Bakteriologie am Chemischen-laboratorium von R. FRESSENIUS, zu Wiesbaden. Vierte vollständig umgearbeitete und wesentlich verbesserte Auflage.

THE METHODS OF BACTERIOLOGY. By DR. FERDINAND HUEPPE.

THIS edition of Hueppe's standard manual of the "Methods" is not to be regarded as a mere republication of the original work brought up to date. It is really a new work, striking out in many fresh directions and introducing scientific principles in quarters where previously one had worked wholly by rule-of-thumb. This is specially exemplified in the chapters devoted to the staining methods, where empiricism used to reign

supreme. Formerly, staining fluids were mixed according to some mystic formula, and, when the desired result did not appear, one was left but too frequently completely at a loss. Taking advantage of the work of Weigert, Ehrlich, Unna, and Kühne, the author develops a general and homogeneous view of the theory of staining, by which the student can not only understand the rationale of the special methods, but can even modify them as the occasion requires.

The chapters devoted to the methods for obtaining pure cultures should receive special attention here, since in no country have Koch's methods been adopted so completely to the exclusion of all others as in ours. Special stress is laid on the fact that we have no ideally best method, each having its own weaknesses and limits, and that in each concrete case we must seek out the method, or combination of methods, adapted to the purpose in view. Hueppe suggests that the failure to obtain the germ of any of the acute exanthemata may probably be due to the fact that these organisms are able to grow only on unchanged serum albumin, not on gelatine. If this be so, we should have to resort for their separation to the method of dilutions by which Lister first obtained the lactic acid bacillus.

Space forbids our considering this excellent manual in further detail, except by pointing out how the historical way in which the development of the methods is treated, and the principles underlying each advance are indicated, converts what would have been only a description of results into a history of how one of the most inexact departments of knowledge has grown within the last few years into the most exact and promising branch of biological science. To all would-be investigators this book is as indispensable as ever, not only as summarizing the immense and daily increasing literature on the subject, but even more on account of the critical analysis to which this is subjected by one who, formerly a pioneer, still continues to do yeoman-service in the field.

CURVATURES OF THE SPINE. By NOBLE SMITH, F.R.C.P. Ed., L.R.C.P. Lond., Surgeon to All Saints' Children's Hospital, etc. Third edition. 8vo., pp. xvi., 150. London: Smith, Elder & Co., 1889.

THAT a third edition of Noble Smith's work on lateral curvature has been so early demanded (within a year) is sufficient evidence of the high reputation in which it is held by practical physicians. In preparing it the author has added the results of the analysis of another hundred cases of lateral curvature, corrected some errors, and made some remarks upon the Swedish "movement cure."

Speaking of recumbency (page 7) the author advocates "the prone position on a prone couch made after the pattern of Verral, the inventor. The child is more comfortable thus than in the supine position; the back falls into a good posture, the head is held erect. Every movement tends to exercise the dorsal muscles, and to influence the back for good." If enforced rest is recommended, doubtless the prone position is the better, but it is only in exceptional cases that it is to be prolonged, and then we

believe that it should be varied by the lateral position, a hard hair pillow being placed under the prominence.

The author gives sound advice in recommending that supporting apparatus be discarded (page 9), and that mechanical apparatus should be very light, and "should simply *direct the movements of the body to act remedially*. This kind of action is infinitely more powerful for good than statical pressure." Or, in other words, simply as a *reminder*, as we are in the habit of employing them.

In speaking of the Swedish "movement cure," the author points out a danger "in cases where lateral curves are not very pronounced, but where the child is weak and drooping—cases to which it might be thought this system would be well adapted—a danger exists that, instead of commencing lateral curvature, the case may be one of incipient spinal caries. If the latter be the case, one cannot imagine a much more harmful proceeding than the institution of a system of gymnastics."

He concludes by opposing the system in these words: "Lastly, those few cases which would be permanently benefited by the 'movement cure,' will derive an equal amount of good from the treatment here advocated, at a tenth part of the trouble and expense."

It is sufficient recommendation of this well-known work to say that it is an improvement on the previous editions, and we doubt not that it will be as rapidly exhausted as was the last.

J. K. Y.

PULMONARY PHTHISIS; ITS ETIOLOGY, PATHOLOGY, AND TREATMENT. By ALEX. JAMES, M.D., F.R.C.P. Ed., Lecturer on the Principles and Practice of Medicine in the School of Medicine, Edinburgh; Assistant Physician to the Edinburgh Royal Infirmary. 8vo., pp. xi., 285. Edinburgh and London: Young J. Pentland, 1888.

THIS beautifully printed volume is made up of ten chapters and an appendix. In the former are considered the etiology and pathology of phthisis; its types, symptoms, and complications; its treatment, local and constitutional, hygienic, dietetic, and climatic. There is also an excellent chapter on the symptomatic treatment of this disease. The treatment of phthisis, like that of all diseases of which the course is, as a rule, steadily progressive, must be almost entirely symptomatic. The cough, fever, perspiration, pain, dyspnoea, hemorrhage, etc., must be allayed or mitigated, and directions are given, with more or less detail, for accomplishing these important objects.

Lung surgery, which includes the incision and drainage of cavities, is briefly discussed and emphatically recommended.

A cavity, to be amenable to surgical treatment, should, as a rule, be large, single, and basal. At the apex the thoracic walls are too unyielding to permit of the contraction necessary to the cure of a cavity, and, besides, cavities in this part of the lung are usually multiple.

The suggestions of a practical nature contained in the book are too numerous to mention, and make it compare most favorably with other works upon the same subject.

The appendix contains directions for the examination of tubercular sputum.

F. P. H.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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SPARTEINE.

A careful comparative study of the action and uses of some members of the group of cardiac drugs has recently been made by PROFESSOR LEWASCHEW, and the result of his work deserves attention.

Since the introduction of digitalis, about a century ago, the means at our command for the treatment of cardiac diseases have been steadily increasing in number. As a rule, each drug of the class of cardiac tonics has a more marked action on the heart when first given than after its administration has been kept up for some time; if, however, another member of this class be substituted for the first, the substitute may be able to exert its full power. In long-continued treatment one is obliged, therefore, to change the drug from time to time, and for this reason the discovery of new remedies which have a similar action contributes to lengthen the life of the patient, especially in the period in which compensation is accomplished only with the assistance of cardiac remedies. Further, while these remedies may, in the main, have a similar influence on the heart, some have a marked action on the nervous system, others on some special organ; and it is not a matter of indifference which of these means one chooses for various patients, or even for different stages of the disease in the same patient.

Therefore every increase of our resources is desirable and to be welcomed as an enrichment of the resources at our command, and is not to be looked upon as the result of a hunt after novelties, or as throwing discredit and distrust upon digitalis. Each drug should be carefully studied that we may learn how far it is capable of acting as a substitute for digitalis, adonis, etc., and what the accompaniments of such action may be.

Sparteine has been studied by many observers, and a review of the labors of those who have cultivated the field, experimentally and clinically, shows a wide divergence of opinion. Germain Seé, Laborde, and Legris ascribe to sparteine an action on the heart as energetic or even more active than that

exerted by digitalis. On the other hand, Fronmüller noted an increase in the amount of urine excreted, but does not mention its action on the heart. Leo also noted diuresis, which he ascribes to an action of sparteine directly upon the renal epithelium. H. Voigt, Stoessel, and Prior recognized the action of sparteine upon the heart, but considered it much less in degree than occurs with digitalis. They also noted an increase in the amount of urine, but ascribed it to the influence of sparteine on the circulation.

Finally, Nasius denies to sparteine any action on the heart or urine.

Such differences of opinion about the action of sparteine are extended also to what should constitute the proper dose. Authors give amounts varying from three grains several times a day to one-thirtieth or one-sixtieth of a grain at a dose, with one-fifteenth of a grain as a daily maximum.

Professor Lewaschew's aim was not only to find out whether sparteine does act upon the heart, and if so in what manner, but also to determine if it causes diuresis, and if so, in what manner it is accomplished. Further, to ascertain if sparteine is of any therapeutic service in cardiac diseases, and especially to study the relation between sparteine and other drugs acting upon the heart and kidneys.

Sparteine was given in 22 cases of cardiac disease, and in only 7 was there any obvious therapeutic action. Of the 15 others, 3 were not relieved by large or small doses of sparteine nor by digitalis or adonis; 12 of the 15, though not relieved by any of a variety of doses of sparteine, did respond to medium and large doses of adonis and digitalis by stronger and more regular cardiac action, increase in the amount of urine, diminution and disappearance of the œdema, relief of the embarrassed respiration, etc. A comparison of these 12 cases with the 7 in which sparteine proved serviceable, shows that the 12 cases were in the later and the 7 cases in the earlier stages of failure of compensation, in which even a suitable regime might have afforded relief. In slight disturbances of the heart's function sparteine, as well as a small amount of adonis, digitalis, or strophanthus, is capable of a moderate therapeutic action, but where the changes in the heart are more considerable sparteine is inactive and has to be replaced by remedies whose effect is more vigorous.

In no case was it found that sparteine had any influence to increase or regulate the heart's action, or promote diuresis, when this had not been accomplished by sufficient doses of digitalis, adonis, or strophanthus.

The results obtained by Professor Lewaschew explain the discrepancies of the observers who have reported upon the action of this drug, those who noted a marked therapeutic action from the drug probably used it in cases where the failure of compensation was slight, and, on the other hand, the authors who condemned sparteine probably gave it in old cases where there was much degeneration of the cardiac muscle and the conditions such as to lead them to infer that the drug had little or no influence in cardiac disease.

It does not seem probable, in view of the experience in the seven cases where sparteine was given with success, that it will prove of lasting service in any patient. Among these seven cases, in which sparteine was more or less successful, there was only one in which it succeeded in restoring the balance of the circulation for any considerable period, in all the other cases it was necessary to resort to adonis, digitalis, or strophanthus.

As regards other action of sparteine than that of the heart. It relieved the breathing and asthma, at the same time it increased more or less the amount of urine, whether this last was brought about, as some believe, through the circulation, or, as others assert, through the renal epithelium, is not easily proven by clinical observation. It is more probable that it is the result of improvement in the circulation. In the cases in which sparteine had a diuretic action it also increased the heart's action as well and made it more regular; on the other hand, there was never any diuresis without cardiac stimulation, though it did not occur in all cases in which the heart was influenced by the drug. Further, if sparteine is a diuretic through action on the kidneys and independently of the circulation it should increase the flow of urine in diseases, like cirrhosis of the liver, where the dropsy is not dependent upon a weak heart; but in these cases all observers agree that it does not increase the urine or diminish the œdema. In health the drug does not seem to have any marked influence on the amount of urine secreted.

The rapidity with which the action of this drug may be induced deserves attention; and here also the views of different observers are not in accord. In the cases where positive results followed the administration of sparteine a series of observations on the heart and blood-pressure were made both before and after its administration; it was ascertained that the action of sparteine when it took place at all, appeared promptly, in some cases it began in fifteen minutes after it had been taken.

In general, it may be said that sparteine is capable of strengthening and regulating a weak and irregular heart, and that this action is exerted promptly, though it is far weaker than that of digitalis, adonis, and strophanthus. It promotes diuresis in cardiac cases, and this action cannot be said to be the result of a local action on the kidneys.

The dose is from one and a half to four and a half grains a day, given in three or four doses. In these amounts the undesirable accompaniments do not go beyond irritation of the alimentary canal, which may result in diarrhœa, seldom in nausea and vomiting.¹

A CONTRIBUTION TO OUR KNOWLEDGE OF THE PHYSIOLOGICAL ACTION OF ANTIPYRIN.

RAYNER D. BATTEN and T. J. BOKENHAM took up the subject of the physiological action of antipyrin in order to find out in what manner the drug might act in megrim and kindred diseases. The experiments were conducted in the laboratory of Dr. Brunton, and the experimenters had the benefit of his advice and suggestions.

These investigators conclude that the main, if not the sole, action of antipyrin is due directly or indirectly to its influence on the nervous system. It appears to act on all parts of it, mainly on the spinal cord, but also on the brain and motor nerves. Means of absolutely satisfying themselves as to the tracts of the spinal cord which are specially affected by antipyrin were not found, but if the symptoms produced by a drug may be compared with those the result of a disease, the localization of antipyrin is fairly obvious. The

¹ Zeitschrift für klinische Medicin, vol. xvi., 1889.

symptoms in question bear a very strong resemblance to those of lateral sclerosis, and they, therefore, think that the action of the drug may be localized in the lateral columns of the cord. For instance, in guinea-pigs and a cat spastic rigidity of the hind limbs was found, and, in all animals experimented upon, rigidity formed a marked symptom. Further, in the first-mentioned animals this symptom appeared to come on with any attempt to use the limbs, just as is the case with a patient with lateral sclerosis.

The excess of myotatic irritability is also very marked, the slightest tap being sufficient to evoke violent muscular contractions, and in extreme cases to cause clonic spasms of the whole body. In one experiment phenomena exactly similar to those of ankle-clonus were obtained. In all cases the contrast between the effect of painful stimuli and stimuli such as the slightest taps, or even the vibrations produced by walking about the room, was most marked, the former producing less effect than in a normal animal, while the latter caused the violent spasmodic movements already mentioned.

The localization of the action of drugs on the different tracts of the spinal cord appears to be a field of research in which, as yet, little has been done, and is one that gives promise of very interesting and useful results. The effects of antipyrin are so transient, seldom extending over more than a few hours, and the recovery is so complete that pathological results demonstrable by the microscope are hardly to be expected. Further, doses sufficient to cause death produce other symptoms not referable to the lateral columns alone.

The importance of being able to localize the action of a drug to a special tract of tissue cannot be over-estimated, and if further work should prove this to be possible it will go far to render the use of drugs in diseases of the nervous system a more rational proceeding. As regards the action of antipyrin on the brain of mammals, but little can be said at present. From the rapid rhythmic movements noticed in many cases, and from the circulo-movements sometimes observed, it may be concluded that either the motor centres themselves are involved, or that their inhibitory power is abolished.

Clinically, we sometimes meet with cases of poisoning by antipyrin, and it is interesting to observe that here, also, the symptoms are mainly nervous. — *British Medical Journal*, June 1, 1889.

INTOLERANCE OF ANTIPYRIN.

In view of the frequent use of antipyrin, both with and without the advice of a physician, and in connection with the physiological action of this drug, the following case is suggestive:

In a man of fifty years, suffering from sciatica, five grains of antipyrin three times a day were prescribed. The first and only dose was taken at 11.30 A. M. He instantly experienced a sensation of tingling and burning in his gums, which rapidly extended to the throat and nose, accompanied by sneezing, running from the eyes and nostrils, dizziness, complete loss of vision, a feeling of numberless pins pricking him down each side of the neck, tightness in the throat, and dyspnoea.

The pin-pricking sensation extended rapidly down the right side of his chest and abdomen, and was particularly severe in the right side of the scro-

tum and right testicle, and was also felt in the legs and feet—severely in the right and slightly in the left.

He next experienced a sensation as if the contents of his thorax and abdomen were being forcibly drawn upward toward his throat, and the right testicle toward the abdomen; so that, he says, he “was drawn in a ruck,” and, being no longer able to stand, he fell on the floor. He trembled violently all over, and had a cramp in his right arm and hand.

His physician arrived fifteen minutes after he had taken the dose, and found him sitting in a chair declaring that he was unable to remain in a recumbent posture. His face was of a dusky red color; his nose, lips, and eyelids were so swollen as to render his features quite unrecognizable; he was trembling violently all over, and the fingers of his right hand were clenched in the form of a claw. Pulse scarcely perceptible.

The symptoms gradually subsided; the following day, with the exception of a slight headache and loss of appetite, he had completely recovered.—*British Medical Journal*, June 15, 1889.

ANTIPYRIN IN THE TREATMENT OF HÆMORRHOIDAL ULCERS.

DR. J. SCHREIBER gives an account of a man, seventy-two years old, who had suffered for ten years with the most obstinate hæmorrhoidal ulcers. By dusting the ulcers for twenty days with finely powdered antipyrin he produced a perfect cure. Each application caused moderate pain, lasting about half a minute, but the effect of the drug on the pain and continual itching of the ulcers was very favorable.—*New York Medical Journal*, May 11, 1889.

ANTIPYRIN IN DIABETES MELLITUS.

For some time past the attention of several well-known French physicians has been given to the treatment of glycosuria with antipyrin, the results obtained being such as to merit a very favorable opinion of its value in such cases. One of those who have reported on it at length is M. Germain Sée, who, while administering antipyrin to a diabetic patient for neuralgia, was astonished to find that the sugar entirely disappeared from the urine. Previous to this, however, Huchard had used it with good effect in polyuria, and Dujardin-Beaumetz in diabetes. Germain Sée, having confirmed his first observation, made a series of experiments on animals in which he had induced glycosuria artificially, and these further demonstrated the power of the drug to diminish the excretion of glucose. He is an upholder of the theory that in diabetes there is an over-production of glucose, and maintains that consequently the prime indications are—(1) to use drugs which depress the nervous system, and thereby lessen the chemical and nutritive activity of the body, and (2) to reduce the sources of glucose by giving chiefly a flesh and fat diet.

The first indication is met by antipyrin, which has in a remarkable degree the power of depressing the excitability of the central nervous system, and at the same time of lessening the excretion of urinary solids and water. Hence there can be no doubt that the entire bodily metabolism is retarded by it. In this country opium and its derivatives are the drugs chiefly relied on for the treatment of diabetes, and it is pretty generally recognized that their bene-

ficial effects are due to the similar sedative action which they exert on the activity of the nervous system. The second indication is met, of course, by the classical dietetic treatment.

Sée has observed carefully eighteen cases, in five of which the prognosis, owing to tubercle or rapid emaciation, was hopeless from the beginning. The other thirteen were typical cases of diabetes mellitus, passing two to six litres of urine per diem, containing twenty-five to eighty-five grammes of glucose per litre. All these improved rapidly in from three to twenty days, the urgent symptoms passing off, and the sugar falling to a few grammes, or entirely disappearing. Various complications, such as boils, eczema, pruritus, and neuralgia, disappeared at the same time. All these patients suffered more or less from obesity, a diminution in which was often one of the first signs of recovery. As soon as the increased appetite and the exaggerated formation of glycogenic material are stopped, the obesity, which is the consequence of the transformation of much of the food into fat, begins rapidly to diminish. The best results are obtained by the administration daily of 48 grains of antipyrin, in three doses. Sée is strongly of opinion that the dietary should contain about seven ounces of fresh bread, and the same quantity of boiled potatoes, in the twenty-four hours. This, he points out, satisfies the craving of the patient for carbohydrates, and has a good effect on his general health, while both articles of food, owing to the large percentage of water which they contain, really convey less starch to the patient than the toasted bread or dried crusts which are so often allowed.

Robin has also recorded very carefully the observations made by him in four cases of diabetes, all occurring in patients well past middle life. His results, however, cannot be said to be more encouraging than those which we already obtain by combining a dietetic treatment with large doses of opium. He is of opinion that although antipyrin does not cure glycosuria, it nevertheless exercises so decided and energetic an effect on the excretion of glucose, and such an improvement in the various symptoms, that it is worthy of an extended trial. He gives various cautions regarding it, pointing out that larger doses than 48 grains per diem are apt to cause slight albuminuria, while one frequently sees loss of appetite, pallor, puffiness of eyelids, or a feeling of tension in the face, all of which are indications for discontinuing the administration of the drug. It also increases greatly the acidity of the urine, and hence it is advisable to administer bicarbonate of soda along with it. Lastly, he advises that its continuous use should not be prolonged beyond twelve days, an interval of several days being allowed before it is resumed again, and suggests that, by alternating the dietetic and antipyrin treatments, one can advantageously avoid the monotony of the former and the dangers of the latter.

The results obtained so far seem to show that antipyrin will be found of value chiefly in those cases of diabetes occurring in elderly, well-nourished, stout subjects, in whom the prognosis as regards life is favorable. Such patients often object most strenuously to the restrictions imposed on their eating and drinking, and if by the use of antipyrin we can advantageously relax the strictness of the dietary, it must be admitted that we have gained an important addition to our resources for the treatment of diabetes.—*British Medical Journal*, June 29, 1889.

THE TOPICAL USE OF ACETANILIDE.

DR. A. H. NEWTH has used acetanilide as an external application for a few months, and reports favorably of it as an adjunct to other remedies. He has used it in psoriasis, in association with mercurials. He has also employed it in chronic irritable ulcer, erysipelas, urticaria, herpes, and a few other conditions of the skin, where there has been considerable irritation. The strength of these applications has been, for the most part, twenty grains of the drug to an ounce of lanolin or vaseline.—*New York Medical Journal*, May 4, 1889.

A TONIC FORMULA.

DR. AUSTIN FLINT has prepared a formula in which most of the important inorganic salts of the blood are represented, with an excess of sodium chloride and a small quantity of reduced iron, the various salts, except the sodium chloride, being in about the relative proportion in which they exist in the normal circulating fluid. The preparation is now made in the form of compressed tablets and sugar-coated tablets.

Saline and chalybeate tonic.

R.—Sodii chloridi (c. p.)	3iij.
Potassii chloridi (c. p.)	gr. ix.
Potassii sulph. (c. p.)	gr. vj.
Potassii carb. (Squibb)	gr. iij.
Sodii carb. (c. p.)	gr. xxxvj.
Magnes. carb.	gr. iij.
Calc. phosp. præcip.	℥ss.
Calc. carb.	gr. iij.
Ferri redacti (Merck)	gr. xxvij.
Ferri carb.	gr. iij.—M.

In capsules No. 60.

Sig.—Two capsules daily after eating.

In the great majority of the cases of anæmia, etc., in which iron was strongly indicated, the tonic seemed to act much more promptly and favorably than the chalybeates usually employed. In a certain number of cases in which patients stated that "they could not take iron in any form," the tonic produced no unpleasant effects.—*New York Medical Journal*, May 18, 1885.

THE INTERNAL USE OF CHLOROFORM.

Chloroform has long been used internally as a symptomatic remedy in flatulence, diarrhœa, neuralgic pains, and cough. It is a substance which is quickly absorbed by the stomach and as quickly passes out of the system by the lungs, skin, and kidneys. Its specific use for serious maladies has rarely been attempted.

DR. STEPP was led, by the experiments of Salkowski on the disinfecting power of chloroform water, to try its effects in acute pharyngitis, diphtheria, whooping-cough, croupous pneumonia, and typhoid fever. Negative results were obtained in diphtheritic and in tubercular cases, although locally, as a gargle, chloroform water is very useful.

Dr. Stepp particularly insists, however, upon the value of chloroform water in typhoid fever. The mode of application was fifteen drops of chloroform dissolved in five ounces of water given in equal parts daily. The temperature was invariably found to sink in a few days so as to induce reconvalescence.

But far more remarkable was the influence exerted by the chloroform treatment upon the sensory organs. Numbness, the specific typhoid face and expression, and hardness of hearing disappeared under the treatment in three to four days; the patients grew lively and cheerful, and nothing short of an actual measuring of the temperature would have betrayed the presence of the insidious malady. The author ascribes this favorable influence of chloroform over the typhoid process, not to any disinfecting properties of the drug itself, but to the products of its chemical decomposition within the system.—*Medical Record*, June 8, 1889.

MEDICINE.

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HÆMOGLOBINURIA.

BRISTOWE (*Brit. Med. Journ.*, 1889, 1, 998) has made some clinical experiments on a case of hæmoglobinuria, which are so valuable that they deserve an extended notice. The patient had, in the winter of 1885-6, lost several phalanges by what he said was frost-bite, but which the author thinks had some connection with Reynaud's disease. The following winter, after prolonged exposure to cold, he was seized with shivering and headache, followed by a discharge of porter-colored urine. There was also pain and difficulty in swallowing. Though well each summer, he suffered in a similar way each winter. On admission to the hospital he was pale and sallow. There was no fever. The urine contained hæmoglobin and a little albumin, but on the following day was normal. As these attacks came on the least exposure to cold, it was resolved to make some experiments upon him, with his consent. He was accordingly sent out for a walk lasting three-quarters of an hour. He returned, shivering, bluish, with no appetite, with a sensation of swelling of the throat, with hands livid and swollen, and with feet cold. The temperature was 102° F., and in two hours there was hæmoglobinuria. On the next day the condition was normal. Several similar experiments were made; the symptoms being virtually the same on each occasion. On several occasions the blood was examined, and it was found that each attack was accompanied by decided temporary diminution of the number of red blood-cells, and

more or less decrease in the amount of hæmoglobin. Sometimes the amount of hæmoglobin was not affected. The red blood-cells exhibited great variation in size and shape. Granular masses of pigment were floating about, and crystals of hæmoglobin formed. A laryngoscopic examination of the throat gave no explanation of the difficulty in swallowing and the sensation of fullness.

The author claims a similarity between this condition and pernicious anæmia. In the case reported there was a remarkable and rapid destruction of the red blood-cells, which took place in the systemic circulation; the pigment thus produced appearing in the urine. The same destruction of corpuscles is characteristic of pernicious anæmia, but the process seems to take place in the portal circulation, so that the hæmoglobin is got rid of during the passage of the blood through the liver.

PROPEPTONURIA; A COMMON OCCURRENCE IN MEASLES.

LOEB (*Centralbl. f. klin. Med.*, No. 15, 1889) says that in spite of the common assumption of the rare occurrence of propeptone in the urine, he has been able to recognize it in the large majority of his cases (nine out of twelve) of measles in which he examined for it. Nitric acid, added by drops to the urine, produced an abundant, white, flocculent precipitate, which redissolved on warming the urine, but reappeared after it had cooled. Concentrated acetic acid acted in the same way, as did a solution of sodium chloride. Numerous other corroborative tests were employed. The propeptonuria usually appeared with the commencement of the disappearance of the eruption, or after this had already begun, and nearly always lasted during two days.

Regarding the relation of propeptonuria to the diazo-reaction, which Fischer found so uniformly present in measles, the author obtained a well-marked diazo-reaction in every case in which propeptone was present. Sometimes, however, the former was present when the latter could not be obtained.

The origin of propeptonuria in measles can only be a matter of conjecture. The author has repeatedly noticed an enlargement of the liver in this disease, and thinks there may be some connection between this and the change in the urine. On the other hand, it may depend in some way on the affection of the skin; this being rendered the more likely by the fact that he has repeatedly observed propeptonuria in scarlatina, while by other writers it has been seen in urticaria, diffuse dermatitis, and in animals which have been rubbed with petroleum.

MALTA FEVER.

D. BRUCE (*Brit. Med. Journ.*, May 18, 1889, 1101) defines this affection as an endemic disease of long duration, whose characteristics are fever of a continuous, remittent, or intermittent type, in most cases enlarged spleen, profuse perspiration, sudamina, constipation, relapses almost invariably, pains of a rheumatic or neuralgic character, sometimes swelling of joints, or orchitis. It ends almost always in complete recovery. In fatal cases are to be noted enlargement and softening of the spleen, congestion of the duodenum and upper

part of jejunum, no swelling or ulceration of Peyer's glands, the constant occurrence in various organs of a species of micrococcus.

After a thorough discussion of its etiology, distribution, mode of prevalence, symptoms, diagnosis, etc., he draws the following conclusions:

1. Malta fever is a specific disease, quite distinct from enteric and remittent fever.
2. It is caused by the entrance into the system of a minute parasite.
3. No drug at present known has any power of modifying the action of the bacteria in the system.
4. Treatment is to be principally directed to maintaining the patient's strength by easily digested fluid food, and, when required, by stimulants; and attention to ordinary hygienic principles. Removal of the patient from the infectious area does not cut short the course of the fever.

COUNTER-IRRITATION IN WHOOPING-COUGH.

INGLOTT (*Brit. Med. Journ.*, 1889, i. 885) says that during the last year whooping-cough was very prevalent in Malta, and was very often of a severe type. He was called to treat a good many cases of the disease, and tried the administration of several medicines, as bromides of potash, valerian, assa-fœtida, morphine, belladonna, etc., and though he carefully watched their effects, he could not see that any of them proved of much use. He was then led to try the application of strong counter-irritation over the pneumogastric nerves, between the mastoid process and the angle of the lower jaw. The results were very satisfactory. In one case, which he relates as an example, a boy of twelve years suffered from such violent paroxysms that blood came from his eyes and mouth, and a fatal termination was feared. Various remedies, including morphine hypodermatically, had proved useless, but the application of counter-irritation on both sides of the neck acted like magic, as in from four to five days the patient recovered, and was able to go to school.

ARTIFICIAL NOURISHMENT IN THE TREATMENT OF DIPHTHERIA.

The insight, says RENVERS (*Therap. Monatsh.*, 1889, 145), which we have lately gained into the origin of infectious diseases, leads us to endeavor to treat them antiseptically, directing the treatment principally against the seat of entrance of the germ. Soon, however, it became evident that though the results in surgery were brilliant, not much was being accomplished in internal medicine, since the antiseptic substances capable of affecting the germ after entering the body were injurious also to the cells of the organism. In that most dangerous of all the infectious diseases, diphtheria, great numbers of so-called specific means have been employed in the way of local antiseptic medication, but none has proved itself of any real value. In diphtheria, as in most other infectious diseases, we have been reduced to the employment of indirect treatment. Our effort in the disease must consist in: 1. Lessening the intensity of the local process. 2. Sparing and supporting the strength of the patient. The carrying out of the second point is much the most important, though in the search after specific treatment it has often been overlooked. It is also sometimes a matter of great difficulty, on account of an

utter absence of appetite. If one will notice at the sickbed how little nourishment is taken by patients with diphtheria, both children and adults, one will cease to be astonished at the rapid loss of strength and the frequent occurrence of collapse. To the disgust for food is often added the inability to swallow, or the still worse condition when, on every attempt to take nourishment, food passes into the windpipe. The author has, therefore, adopted the employment of artificial feeding by means of the stomach tube in diphtheria. Experience has shown him that this method is easily carried out, and is without injury to the patient. This procedure should, of course, be commenced at the beginning of the disease, without waiting until signs of collapse have appeared, with the attendant interference with absorption. The results of this method have been so excellent that the author reports in detail a number of grave cases in which he employed it. Naturally, treatment was not limited to feeding alone. He sums up the whole course of treatment as follows:

1. Local. Antiseptic solutions for cleansing the throat and mouth, which, however, should be used only every two to three hours. Ice in the mouth and about the neck. Inhalations.
2. No specifics, and no antipyretics even in case of high temperature.
3. The greatest amount of rest possible. To insure this, frequent washing of the mouth, gargling, and repeated examinations of the throat, are to be avoided, while, at the same time, mental excitement is to be guarded against and cheerfulness insisted on.
4. One of the most important drugs to be used to obtain the desired quiet is morphia. He has seen the most favorable effects produced by it, and has never witnessed unfavorable results when given in quite small doses.
5. The nourishment of the patient to be looked after with the greatest care from the first day of the disease. Strong wine to be given. In every case in which insufficient nourishment is taken, whether from distaste for food, pain on swallowing, or paralysis of the organs of deglutition, artificial feeding should be commenced.

SCARLATINAL DIPHTHERIA AND ITS TREATMENT.

HEUBNER (quoted in *Centralbl. f. d. gesamt. Ther.*, 1889, 181) recognizes the difference between scarlatinal diphtheria and diphtheria in the narrower sense, but rejects the term scarlatinal necrosis, because the condition is, in fact, an inflammatory exudation combined with a necrosis; a diphtheria in an anatomical sense, or, as the author designates it, an inflammatory coagulation-necrosis.

The scarlatinal tonsillitis in its milder forms is characterized in the later days of the disease by the formation of large portions of membrane on the tonsils, with swelling of the submaxillary glands, but without noteworthy alterations of the symptoms of the disease. These membranes consist of granular or net-like coagulations in which are imbedded numerous round cells and degenerated epithelial cells, together with microorganisms of different sorts, including Löffler's coccus. After four to five days the membranes disappear, leaving a normal epithelial lining behind.

Of the severe gangrenous forms of scarlatinal sore throat, those will hardly

come into consideration here in which the throat symptoms are only an accompaniment of the other signs of severe general infection leading rapidly to death. These constitute, in Leipzig, about one-eighteenth of all cases. The other severe forms of this anginose complication of scarlatina produce a proportionately greater mortality than does scarlatinal nephritis.

These cases may be divided into two principal sorts: 1. Acute, violent, pestilent, with widespread necrosis in the throat and nasal cavities, and enormous swelling of the lymphatic glands and the periadenitic tissue. This class equals about one-sixth of all cases. 2. The slowly advancing form of gangrenous scarlatinal tonsillitis, seeming to commence at the opening or in the middle of the second week of the disease, although the real beginning is in the first week. These cases offer some hope of treatment. The affection makes itself manifest in that, although the exanthem is disappearing, the general condition of the patient grows worse, the temperature increases, and the enlargement of the lymphatic glands is evident, and an ill-smelling liquid flows from the nose, although the plaques on the tonsils are not observed. In the second week the characteristic symptoms of the disease are developed. There is then infiltration of the glands and the surrounding tissues, pale coloration of the skin, salivation, a widespread necrosis of the mucous membrane of the pharynx, continued high fever, collapse, diarrhoea, loss of appetite, and sepsis with its local appearances, such as purulent pleuritis, thrombosis of the veins of the neck, purulent inflammation of the joints, etc.

The bacteriological studies which have been made by different investigators render it probable that we have to do here with a severe mixed infection of the scarlatinal poison with a streptococcus. Löffler's "chain coccus" produces in scarlatina neither the diphtheritic necrosis of the tissues nor the sepsis; and it seems rather more probable that the appearance of the scarlatinal diphtheria in a legitimate phase of the general disease is a proof that the throat changes depend on an action of the scarlatinal poison itself, and appear at a time when this action has reached its height in the human organism. The death of the tissue is first brought about by the direct action of the scarlatinal contagium, and then the streptococci establish themselves in these tissues, penetrate into the lymph-channels, and produce the septic infection of the glands. It is against this sepsis that the author directs the treatment; a method which was first introduced by Taube. He claims to have diminished the mortality from 35.5 per cent. to 10 per cent. The procedure consists in the systematic injection into the tonsils of a 3 per cent. to 5 per cent. solution of carbolic acid. At least twice daily he injects 0.5 gramme of this into the soft palate on each side, using an ordinary hypodermatic syringe with a long canula, whose end is shaped in such a way that it cannot penetrate more than one-third to one-half centimetre into the tissues. It should be borne in mind that the injections should be commenced before the process is apparent on the tonsils or soft palate, although only the nasal cavities seem to be affected. The injections are not to be continued until all the necrotic tissue is cast off, but only until the swelling of the glands has disappeared, and the morning temperature returned to normal. If, however, there is inflammation of the middle ear there will be fever, and one can be guided as to the injections only by the disappearance of the glandular swelling.

THE CUTANEOUS VASCULAR REFLEXES IN PHYSIOLOGICAL CONDITIONS
AND IN FEVER.

MARAGLIANO (*Deutsch. Arch. f. klin. Med.*, B. xlv. 265) has studied the variations in the rapidity and volume of the pulse, obtained by sealing the forearm in a glass vessel and taking sphygmographic tracings. The skin of the other arm was meanwhile irritated by an electrical current. He discusses the subject at length and comes to the following conclusions.

First, as regards the reflexes in physiological conditions, he says:

1. Irritation of the skin is not always followed by vascular reflexes.
2. If vascular reflexes do occur they may be—and by far most frequently are—of a constrictive nature, or they may exhibit evidences of dilatation.
3. The period between the moment of irritation and the beginning of the reaction varies with the individual. The latter may appear in 3.1 seconds or not until after 6.8 seconds.
4. The reaction reaches its maximum intensity after a lapse of time which also varies with the person; the minimum being 2 seconds and the maximum 14 seconds.
5. The duration of the reaction also varies with the individual, extending from 10 to 12 to 45 seconds.
6. The time required by the vessel to return to its original calibre varies from 15 to 64.8 seconds.
7. The vascular reaction is not always proportional to the intensity and duration of the irritation.
8. During sleep and after eating the vascular reflexes are much more active than when the subject is awake or with an empty stomach.

Regarding now the results obtained in febrile conditions, the author's conclusions are as follows:

1. The vascular reactions in patients with fever are generally indicative of constriction, but sometimes of dilatation.
2. Sometimes the principal reaction is preceded by a momentary reaction of the opposite nature.
3. The bloodvessels do not react the same way in the same individual during the existence of fever and during the state of apyrexia.
4. The vascular reactions during fever are generally more energetic, prompt, and persistent than in the afebrile period. The opposite condition is, however, sometimes observed.

SIMULO AS A REMEDY IN EPILEPSY.

M. ALLEN STARR (*Med. Record*, May 11, 1889) refers to the reports of White and of Eulenburg on the use of simulo in epilepsy, and then details his own experience with it in seven interesting cases of the disease. The general conclusions which he draws from these cases are as follows:

1. Tincture of simulo has no effect upon attacks of hystero-epilepsy or upon the hysterical state.
2. Tincture of simulo has some effect in modifying the frequency or severity of attacks of petit mal or of procursive epilepsy.
5. Tincture of simulo has some effect in modifying the frequency and severity of attacks of grand mal, but is inferior in this respect to the bromides.

4. In cases when for any reason it is deemed necessary to suspend the bromides, it would be well to substitute simulo for them.

The author says there seems to be no ill effect from the use of the drug. He has found no evidence of change in the rate or character of the pulse or respiration, no dilatation or contraction of the pupils, no muscular weakness, no mental depression or excitement, and no disturbance of the digestion in the doses in which it was used. He thinks it would be well to increase the dose progressively until one or even two ounces are used daily. The chief objection to its use at present is its costliness, the price being twenty-five cents an ounce.

THE TREATMENT OF TABES BY SUSPENSION.

BERNHARDT (*Deutsch. med. Wochenschr.*, 1889, No. 21) has, during the last quarter of a year, treated 19 patients, with about 220 suspensions. Most of these were tabetic patients, some of whom had received more than 20 suspensions, others between 15 and 20. By all, even the very ataxic, the treatment was well borne. Apart from the beneficial psychic effect on the patient of a new method of treatment, there was an indubitable improvement in nearly every case. Some, it is true, stated that they felt no better, but in the majority Bernhardt recorded amelioration of the lancinating pains, increased ability to walk, diminution of the ataxia, increased vesical power, in some cases a decided influence on the lost sexual power, and in nearly all an improvement in the general condition.

He warns, however, against viewing this plan of treatment as a panacea for such a chronic disease as tabes is, and says that it has not yet been used long enough to permit of a final judgment on its value. It is certain, however, that it is a valuable means, though not for the healing of tabes, yet for the amelioration of many of the most distressing symptoms of the disease.

FRIEDREICH'S ATAXIA.

SUCKLING (*British Medical Journal*, May 18, 1889) exhibited at a meeting of the Midland Medical Society three new cases of this affection. The first was a girl of eighteen years, who noticed, when fifteen years old, that she could not properly direct her feet. The inability increased, and soon affected the upper extremities. There were ataxic gait, ataxic station, Romberg's symptom, tremor of the head and trunk, slurred speech, and absent knee-jerk. There were no affection of sensation, vomiting, trophic changes, affection of the pupils, nystagmus, disturbance of the functions of the rectum or bladder, involvement of intellect, or curvature of the spine. The patient's brother was quite crippled by the disease, having been first attacked when about thirteen years old. No further history of the disease in the family could be obtained.

The other two cases were brothers. The eldest, aged twenty-five years, was unable to stand, and presented marked antero-posterior and lateral curvature of the spine, nystagmus, paresis with ataxia, talipes equino-varus and abolition of the knee-jerk. In the younger brother, aged seven years, the spine was beginning to be curved, the knee-jerk was lost, and the gait was slightly ataxic.

SPINAL LOCALIZATIONS AS INDICATED BY SPINAL INJURIES IN THE LUMBO-SACRAL REGION.

WM. THORBURN (*Brit. Med. Journ.*, 1888, i. 993) has compared a number of clinical records of cases of spinal injury, in the endeavor to determine the functions of various nerve-roots of the crural plexus. In a previous publication he discussed the cervical region in the same way. He describes the clinical material at his disposal as of two kinds: First, injuries of the cord itself, in which, given the region of the injury and the extent of the paralysis, we can deduce the region of origin of the affected roots; second, injuries of the cauda equina, in which we may localize the more completely paralyzed nerves at a lower level than those which escape.

The analysis of a number of cases of spinal injury belonging to both these classes leads him to certain conclusions as to the functions of the various nerve-roots. These he summarizes in a useful table, which we copy nearly as it stands.

<i>Root.</i>	<i>Motor distribution.</i>	<i>Sensory distribution.</i>
First lumbar.	None.	Ilio-hypogastric and ilio-inguinal nerves.
Second lumbar.	None.	Outer [?] and upper part of thigh.
Third lumbar.	Sartorius; adductors of thigh; flexors of thigh	Anterior aspect of thigh below second lumbar.
Fourth lumbar.	Extensors of knee; abductors of thigh.	Anterior part of leg.
Fifth lumbar.	Hamstring muscles.	Part of back of thigh.
First sacral.	Calf muscles, glutei, peronei.	A narrow strip on back of thigh; back of leg and ankle; sole; part of dorsum of foot.
Second sacral.	Extensors of ankle; intrinsic muscles of foot.	
Third sacral.	Perineal muscles [except levator ani].	Perineum; external genitals; inner and upper part of back of thigh.
Fourth sacral.	Bladder and rectum.	

COMMON MEMBRANOUS SORE THROAT.

Under this title, for which he gives numerous synonyms, J. SOLIS-COHEN (*New York Medical Journal*, 1889, xlix. 317) describes "a rather frequent form of sore throat, often confounded with diphtheria, occurring at all seasons, characterized by the exudation of products eventually fibrinous, which coagulate upon the surface of the mucous membrane into a pellicle or pseudo-membrane." The general subjective symptoms are those of acute sore throat with marked febrile disturbance. The parts feel dry and hot; and these sensations sometimes extend into the ear, sometimes into the posterior nares, and in a few cases into the larynx. Deglutition is difficult and painful. If the larynx is involved, there will be hoarseness, dyspnoea, and cough. The

disease is usually unilateral, and the corresponding submaxillary and cervical glands sometimes become moderately swollen. The local changes in the throat begin as small vesicles the size of a millet-seed or larger, surrounded by zones of inflammation, and situated always on the soft palate and uvula, sometimes on the tonsils, and more rarely on the pharynx and hard palate. These vesicles may disappear without further trace, but usually they rupture after twenty-four to thirty-six hours, and leave small excoriations which almost immediately become covered with a grayish-white plastic exudation. These patches extend and coalesce. In some cases the vesiculation is limited to the uvula, in which case the false membrane sometimes does not form, the mucous membrane simply becoming swollen and pasty-looking. In children the membrane sometimes extends into the larynx. In most instances the tonsils become slightly swollen and then covered with a slightly adherent, yellowish-white exudation. If the membrane on the soft palate be removed comparatively early, the surface beneath is often found eroded; but when removed later the mucous membrane appears normal, the erosions having healed.

Exposure to emanations from inefficient house-drainage and the like is often the apparent predisposing cause. The most frequent exciting cause is exposure to cold while overheated. The disease is often contracted by susceptible subjects during the prevalence of diphtheria, and then becomes the starting-point for the latter affection.

The disorder has been regarded as a herpes zoster of the trifacial nerve, the result of irritation of the sphenopalatine ganglion.

Great difficulty is often experienced in diagnosis, because the disease is rarely seen in the vesicular stage. Sometimes one or more excoriations left by the rupture of a vesicle can be found; or the transparency of some islets of pseudo-membrane indicate recent formation from a vesicle. The coexistence of cutaneous herpes is a valuable sign when present. Differentiation from diphtheria is impossible in many cases, but the elevated temperature of 102° – 105° , so out of proportion to the mildness of the symptoms, and the absence of exposure to diphtheria are important factors in diagnosis in doubtful cases. Mycotic sore throat is easily distinguished by the absence of fever.

In the majority of cases recovery takes place in seven to ten days, but occasionally death occurs in children by extension of the membrane into the larynx. Recurrences are not infrequent; sometimes so frequent that the patient has a chronic membranous sore throat. Phagedenic ulcerous sore throat may be a sequel in debilitated subjects. Paralysis of the palate sometimes follows.

No special treatment is required when the diagnosis can be made with certainty. Antiseptic and detergent sprays are of service when there is fetor. Lemon-juice is often an agreeable and efficient application. In strumous or tuberculous individuals, in whom there is a constitutional tendency to chronicity, more active treatment must be employed: such as applications every day or two of dilute acids, and iron and cinchona internally. Opium, in small doses, is particularly useful as a gentle stimulant or nervous tonic. Nux vomica or arsenic may be employed for the same purpose. The diet should be nutritious; exposure should be avoided; supportive measures

should be used. In case of recurrent or chronic membranous sore throat, the cause should be sought in the dwelling or place of business, and removal advised, should these be found unhealthy.

THE TREATMENT OF EMPYEMA BY A VALVULAR RUBBER TUBE
HERMETICALLY SEALED TO THE CHEST.

W. WILLIAMS (*British Medical Journal*, May 18, 1889) speaks of the difficulty usually encountered in treating empyema, this consisting in the fact that the cure is left almost entirely to the retraction of the chest-wall. It is only after the external wound closes and the atmospheric pressure is excluded that there can be any reëxpansion of the side of the chest, carrying the lung outward again; if, after this length of time, it is still able to expand at all. Children recover so much more readily, because the chest-wall rapidly falls in, the opening closes, and the chest then again expands and attains its normal condition before the lung has had time to form firm adhesions.

To aid in the recovery from the disease in adults, the author has devised a valvular tube, by which the atmospheric pressure from the external surface of the lung is removed, while the external opening still remains. The method consists simply in passing a rubber tube into the chest through a plate which it fits air-tight; the plate itself being hermetically sealed to the chest-wall. To the free end of the drainage tube is affixed a valve which opens outward. As the valve acts best in a liquid, this end of the tube is placed, when in use, in a bottle containing some antiseptic solution. Once or twice each day the valve is removed and the chest washed in order to thin the pus.

By means of this mechanism the side of a chest is converted into the cylinder of a pump, of which the diaphragm is the piston. There are two exit openings, the trachea and the rubber tube, but only one entrance opening, the trachea. Each time that the diaphragm ascends the air of the lung and the pus of the pleural cavity are expelled; but each time it descends air can enter the lung only. The lung must, therefore, necessarily be expanded in order that its tissue may take the place of the pus which has been expelled. During the washings out of the chest, the lung, of course, collapses temporarily somewhat, but expands at once on readjusting the valve.

The author reports three cases illustrating the success of this method. In the first case there was found considerable difficulty in finally withdrawing the tube, since when taken out the lung at once collapsed and pus began again to be discharged. It was then found that by very gradually shortening the portion projecting into the chest, the opening healed from the inside after it. The other two cases were consequently treated in the same way, and without difficulty arising.

THE TRANSMISSION OF PNEUMONIA FROM THE MOTHER TO THE FÆTUS.

NETTER (quoted in *Deutsch. med. Wochenschr.*, No. 22, 1889) has observed the following case of transmission of the pneumonia-bacteria from the mother to the fœtus. A VI.-para entered the hospital on the third day of an attack of croupous pneumonia involving the right upper lobe. Crisis occurred on the night preceding the seventh day, and on the ninth day the patient gave birth to a seven and a half to eight months child, living and well developed.

The child lived somewhat less than five days, and at the autopsy there was found pneumonia of the right upper lobe with fibrinous coating of the bronchi, bilateral fibrinous pleurisy, pseudo-membranous pericarditis, purulent cerebro-spinal meningitis, and bilateral otitis. The right heart contained a fibrinous clot, like those seen in pneumonia of adults. The microscopical examination, as well as the cultures, revealed the presence of encapsuled cocci in all the exudates and in the blood from the left heart. Although no cocci could be found in the placenta and in the vessels, Netter believes that the foetus must have acquired the infection by the way of the placenta. He has seen six cases in which the blood of patients with pneumonia contained pneumococci, and in two cases they could be recognized even in the blood from the uterine vessels.

PROGNOSIS IN HEART DISEASE.

At a recent meeting of the Verein für innere Medicin, DR. LEYDEN discussed the prognosis of diseases of the heart. The question, he said, presented great difficulties, depending not only on the object, but on the mode, of treatment. The difficulties were intensified by the fact that but few previous works were available. Most that had been written on the subject was to be found in English literature, the practical bent of English medicine showing itself in this also. The handbooks of Williams, Walshe, and Bristowe contained observations bearing on the matter. Broadbent and Sir Andrew Clarke had delivered remarkable addresses on the subject. In America, Da Costa might be mentioned. The German text-books did not deal with the question with the precision and completeness that could be desired. He might, however, refer to essays by G. Mayer¹ and Lewinsky.²

Until a short time ago the prognosis of heart disease was looked upon as extremely bad. This universal opinion was enshrined in Corvisart's quotation, "*hæret lateri lethalis arundo.*" A more hopeful outlook had for the first time been taken quite recently. Experience had shown that many sufferers from heart disease lived in fairly comfortable ease. The lay public did not take so pessimistic a view of the matter as before. The gloomy prognosis laid down by Corvisart appeared to be confirmed by the fact that persons with diseased hearts often died suddenly. From this it was concluded that such patients were never safe any single instant of their lives. Closer examination, however—especially by English physicians—had shown that in the majority of chronic heart affections sudden death was rare, except in the case of inadequacy of the aortic valves (aortic regurgitation) and true angina pectoris (of Heberden). For both these diseases the proposition holds good that the patient is not safe any day of his life; but life may nevertheless be prolonged for years. In relation to aortic insufficiency, Dr. Leyden had had a very large experience, both in hospital and private practice. In other kinds of valvular inadequacy sudden death was comparatively rare; in mitral incompetence it occurred in about two per cent. of the cases, that is to say,

¹ On the Curable Forms of Chronic Heart Disease. Aachen, 1881.

² "On the Prognosis of Failure of the Cardiac Valves," in the *Zeitschrift für klinische Medicin*, 1882.

so seldom that the practitioner might leave this unfortunate termination out of account.

Further observations on prognosis might be grouped under three heads: (1) with reference to general disposition and circumstances of life; (2) with reference to special groups of cardiac affections; (3) with reference to particular physical and physiologico-pathological symptoms. In connection with the first of these, the age must first be considered. Young children bear heart disease very badly. In adolescence and early adult life the prognosis is better. This depends on the fact that at that age those forms of cardiac affection chiefly occur in which the prognosis is relatively favorable. At more advanced periods of life, heart diseases are for the most part associated with arterio-sclerosis. This often became developed at a very early stage. Arterio-sclerosis had always a progressive tendency; this progressive character might, however, be very gradual. Compensative changes were easily brought about in more mature years. But precisely because of this progressive tendency, those forms of valvular insufficiency presented an unfavorable prognosis.

The second general etiological factor was the sex. The prognosis was on the whole better in the female than in the male sex. If this was less clearly the case in hospital than in private practice, that was due to the fact that women of the lower classes led a life exposed to the same hard work, the same mental disturbances, and partly the same excesses as men. In women of the upper classes these etiological factors were wanting. Arterio-sclerosis was, moreover, less frequent in the female sex, and even in families in which it was hereditary it affected the female members to a less extent. The female character was better adapted to bear troubles. Finally, experience proved that in women mitral incompetence, in which the prognosis was good, was more frequent than aortic insufficiency.

A third factor was to be found in the patient's circumstances and manner of life. Hard bodily labor was the most dangerous enemy to sufferers from cardiac disease. Even mental emotion often aggravated the condition. The less disturbed by worry the patient's life was, the more care he took of himself, the better was the prognosis; therefore patients in better and easier circumstances bore heart affections better than persons less fortunately situated. A further point was connected with the possibility of treatment and the reaction of the constitution to medicines, of which digitalis was the most important. The right use of that drug was one of the most difficult problems in medicine. As long as digitalis produced its proper effect, the prognosis was fair; if it failed, the prognosis became less favorable, as the effect of other drugs and therapeutic measures was far less certain.

From the diagnostic point of view three classes of heart affections have to be distinguished: 1. Organic defect or disease; 2, disease of the heart muscle; 3, valvular incompetency.

1. With regard to the first of these divisions, the first question which has to be decided in the case of every patient who comes to a physician with disease of the heart is whether the disease is or is not organic—that is to say, whether a definite anatomical lesion underlies the symptoms. The inorganic affections are also designated nervous, neurasthenic, or functional disorders. The distinction between these and organic diseases is sharply defined, so that

in a given case it is always easy to discriminate the one from the other. The answer to this initial question is always of the greatest importance, as a much better prognosis can be given in all merely functional affections. Nevertheless, even nervous affections of the heart are, in exceptional cases, especially in elderly persons, attended with evil consequences, and sudden death has been occasionally known to occur from start or fright. That the disease is inorganic may be presumed when accurate physical examination fails to reveal any abnormality. This proposition holds good with two exceptions. Murmurs, almost always systolic in time and loudest at the apex, may be heard in cases of inorganic disease; even dilatation may be present, as in Basedow's disease. On the other hand, there may be deep organic disease without any abnormality whatever discoverable by physical methods. These circumstances render the diagnostic and prognostic estimate of a particular case difficult. It is no longer possible to affirm that a heart in which murmurs are heard is diseased, and one in which no abnormal physical signs are present is healthy. Angina pectoris is very important in this connection. Three principal forms of that affection can be distinguished, namely (*a*) angina pectoris vera, depending on disease of the coronary arteries, (*b*) angina pectoris symptomatica, which is occasionally met with in all forms of heart disease, and (*c*) angina pectoris nervosa. The first and third of these give rise to no physical signs, but are of very different importance. The whole circumstances of the case must, therefore, be taken into account. In elderly people, especially of the male sex, the disease is more likely to be of the organic form; in younger persons, particularly of the female sex, the probability is that it is of nervous origin. Nervous angina pectoris is, however, also met with in elderly men. As already pointed out, dilatation may occur in Basedow's disease. In such a case, however, the prognosis is not unfavorable in proportion to the severity of the symptoms. Only when the condition is very pronounced, and when complications are present, is life threatened. With regard to the cardiac affections which are associated with disease of the spinal cord, not much is known. In tabes, a form of angina pectoris is met with, whilst progressive muscular atrophy and bulbar paralysis often terminate with symptoms of paralysis of the heart.

2. With regard to the second of the three classes above mentioned, diseases of the myocardium—if those lesions of the heart muscle which are induced by incompetence of the valves be included under this head—constitute perhaps the most important point of the whole subject. The diagnosis of them is difficult, as they are only in small part open to physical methods. Those which can be diagnosed by physical signs may be arranged in three groups, hypertrophy, dilatation, and want of power or weakness of the heart. In addition to these there are combinations of them, besides intermediate forms. The prognosis depends on the dangers which the structural changes entail, and on their amenability to treatment. Hypertrophy is not a disease in itself, and does not call for treatment. This point has been particularly emphasized by English physicians. Hypertrophy is the expression or the consequence of severe disease outside the heart—in the arterial system or in the kidneys. The prognosis depends on the gravity of the primary disease. In spite of the presence of hypertrophy, weak action of the heart may occur.

Dilatation is one of the most important conditions of the heart from the

point of view of prognosis. It is the result of stretching of the muscular substance of the heart, and so far has a less favorable prognosis than hypertrophy. The physician must ask himself whether all dilatations are of equal importance, and whether the condition is susceptible of cure, or rather of improvement, by natural processes, or by medical treatment. There can be no doubt that important differences exist with respect to etiology no less than to prognosis. In the first place, dilatations which are consecutive to valvular incompetence must be distinguished from those which to all appearance occur independently of any previous lesion, and which O. Fräntzel has termed "idiopathic" dilatations. It must be borne in mind that, on the whole, dilatations of the right heart are of less importance than those of the left ventricle. The former may become developed suddenly, and may as suddenly disappear. Hypertrophy of the right ventricle is not so easily retrogressive. Dilatations of the left ventricle are, on the other hand, of the greatest importance, although it cannot be disputed that even these have been cured in particular cases. This holds good especially of dilatations which come on rapidly after acute disease. Traube observed them in acute articular rheumatism; they occur also after typhoid fever, measles, scarlatina, diphtheria, and erysipelas. The slighter forms reveal themselves only by "galloping" sounds; in more advanced cases there is displacement of the apex beat. All these dilatations are susceptible of cure, but it cannot be said that they are free from danger or always curable. Even dilatations of the left ventricle following overstrain, as also those occurring in Basedow's disease, may disappear. Dilatations which have been a long time in developing are less favorable in point of prognosis. In these cases, the prognosis in individual cases depends on the degree of dilatation, the nature of the primary disease, and the amount of compensatory change. If the primary disease is in itself an independent progressive process, such as arterio-sclerosis, the prognosis is unfavorable. It is true that an attempt may be made to improve the efficiency of the heart muscle, but in the majority of cases in which the condition is well marked this will be only temporarily successful.

The newer methods of cardiac therapeutics—Oertel's dietetico-mechanical and Zander's gymnastic system, and balneological treatment—open up a prospect of the possibility of something more being done for those cases than has been accomplished by the treatment hitherto employed. Weakness of the heart's action has different causes, and correspondingly different prognoses. Fainting fits in young, nervous persons must always be judged differently from similar attacks in elderly men who are possibly the subjects of arterio-sclerosis. Acute weakness of the heart in febrile diseases must always be looked upon as a serious matter. Chronic weakness from valvular incompetence is also unfavorable. The new methods of treatment already referred to will have a good effect in this condition by increasing the size of the heart muscle. Weakness of the heart often depends on fattiness of that organ. A distinction must be made between cardiac disease due to accumulation of fat on the heart, and that due to fatty degeneration of its substance. As long as there is no considerable alteration of structure in fatty heart, the prognosis is not bad. It is doubtful when dilatation is established. The prognosis in fatty degeneration is always bad.

3. With regard to the third class of cases, in which there is valvular insuf-

iciency, in the first place it cannot be denied that cases of recovery occur (Beneke, Gerhardt). This happens most frequently in the case of recent mitral inadequacy which has come on with chorea. Recovery sometimes occurs, even in cases of aortic insufficiency. It must be recollected, however, that no inference as to cure can be drawn from the disappearance of a diastolic murmur. The further question whether, without cure of the defect, the patient can be to a certain extent fit for work, and can have any enjoyment in life, is a very important one. It must be remembered that not infrequently heart disease is discovered accidentally in persons who feel perfectly well. There are cases of valvular defect in which compensation remains complete through a series of years. Practitioners are not yet agreed as to the conclusion to be come to in such cases in relation to marriage, life insurance, etc.

The prognosis of aortic insufficiency depending on arterio-sclerosis is most unfavorable. If, besides the diastolic murmur, a heart-sound can be heard, and there is no arterio-sclerosis, the defect can be better borne. Further, the degree of hypertrophy in the left ventricle is of importance. The diagnosis is relatively better in simple mitral inadequacy. It is a mistake to take the loudness of the murmur as a guide in prognosis. The underlying essential disease is the important matter. If this is progressive, as in arterio-sclerosis, the prognosis is bad; it is also mostly unfavorable in acute febrile ulcerative endocarditis. It is comparatively good in cardiac affections consecutive to acute diseases, such as measles, scarlatina, typhoid, articular rheumatism; in the case of the last-mentioned disease, however, both it and the endocarditis are apt to recur. Leaving the form of affection out of account, the prognosis depends on the condition of the heart muscle. Robust, well-nourished persons in good circumstances bear heart disease better than others. On the whole, the prognosis is better in systolic than in diastolic murmurs. A large number of systolic murmurs do originate within the heart, and even a considerable proportion of endocardial murmurs may disappear; only systolic murmurs with an arterio-sclerotic basis are of serious import.

With regard to rhythmical irregularities, intermittence and arrhythmia must be considered. The stoppage of the pulse has as such no serious prognostic significance; it may arise reflexly from the most diverse causes. Arrhythmia is often habitual and of no importance. On the other hand, delirium cordis and tremor cordis are always suspicious. Tachycardia, as the expression of commencing or established paralysis of the vagus, is never unimportant. In fever a pulse of 120 is suspicious; only in children suffering from acute exanthemata can a higher pulse-rate be tolerated for any length of time without injury. Slowness of the pulse, on the other hand, is not of itself suspicious; it is often, however, a sign of weakness and an indication for strengthening treatment and a contraindication of digitalis. Permanent slowness of the pulse, when there is ground for suspecting arterio-sclerosis of the coronary arteries, is always risky. Not infrequently sudden death occurs under these circumstances.—*British Medical Journal*, May 25 and June 29, 1889.

THE DYSPEPSIA OF PHTHISICAL PATIENTS.

KLEMPERER (*Berl. klin. Wochenschr.*, No. 11, 1889) concludes as a result of careful investigations that in the first stage of phthisis the hydrochloric acid

secretion of the stomach is normal or increased, and that consequently in incipient phthisis the administration of hydrochloric acid is to be avoided, though proper in the terminal dyspepsia of the disease. The use of alkalines is, perhaps, indicated for the suppression of pyrosis, but this opens the door to fermentative processes, and thus increases the irritation of the mucous membrane. Especially advisable is the prescribing of drugs which are suited to remove the gastric weakness. Such are alcohol in any form, particularly cognac, and especially bitter drugs. According to the author's latest researches creasote takes the first place among these; it should be given in capsules or pills, or in alcoholic solution, a quarter of an hour after meals, three times a day, in doses increasing from 0.005 to 0.2 gramme. It possesses a remarkable action on the diminished motor power of the stomach; the alcoholic solution being the best when it is well borne. The author believes that the favorable results so generally experienced from the use of creasote in phthisis are not due to a problematic antibacillary action, but to its power of increasing the strength of the stomach. Besides creasote, strychnine, rhubarb, gentian, etc., are useful, as are electricity and massage. Of especial importance in the dyspepsia of phthisis is the condition of the general nutrition. If the body-weight increases and the character of the blood improves, one can be sure that the evidences of dyspepsia will disappear. Too much attention, however, must not be paid to the subjective sensations of the patient in the initial stage of the pulmonary disease; as the appetite comes to the phthisical with the effort to eat. Finally, it is to be borne in mind that the motor function of the stomach is under the control of the nervous apparatus, which in its turn communicates with the brain. Psychic treatment is, therefore, to receive proper consideration.

SURGERY.

UNDER THE CHARGE OF

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THE DIAGNOSIS OF LABIAL AND LINGUAL CARCINOMA.

PROF. VON ESMARCH, in a lecture before the Congress of German Physicians and Surgeons (*Deutsche med. Wochenschrift*, No. 18, 1889, p. 367) discussed the etiology and diagnosis of cancer of the tongue and lip. He called attention to the many mistakes that had been made in the removal of parts, often of great importance, under a diagnosis of malignancy when the disease afterward proved to be syphilitic or even merely inflammatory. He thought that many syphilomata had been diagnosed and removed as sarcomata.

In cases in which repeated examinations gave a negative result, a suspicion of syphilis was justifiable, and in such cases anti-syphilitic treatment could be introduced. He had seen many cases of muscular sarcoma disappear, and had become convinced that in most cases, perhaps in all cases, of sarcoma of

muscle, the tumor was really syphiloma; anti-syphilitic treatment could decide the diagnosis, but it must be steadily persevered in for months.

In many cases in which potassium iodide was not efficient, inunction, infusions, arsenic would effect removal of the supposed sarcoma.

He had proposed the following method in all tumors of the tongue and lips: Where the microscope showed epithelial cancer in the part scraped and excised, to proceed at once to extirpate the tongue and the parts around; if tubercle bacilli were found imbedded in the connective tissue, to scrape out the accompanying ulcers and apply the cautery; if the fungus of actinomycosis were found, to scrape out and apply sublimate gauze; if spindle cells were found, first to suspect a syphiloma and commence energetic anti-syphilitic treatment. The microscope should also be used from time to time, as a syphiloma could be converted into cancer.

If a syphiloma were excised by mistake it would quickly recur, and, finally, general marasmus would terminate the scene. The distinguishing characteristics of malignancy were, the disposition to rapid growth, the recurrence of the tumor, the accompanying affection of the lymphatics, metastases, and, finally, incurability; but the anatomical appearances did not allow a certain conclusion as to the malignancy; the course of cases of tuberculosis was extraordinarily various; sometimes they remain superficial for years, and in others, even after careful clearance of the diseased parts, great destruction of tissue took place, and rapid return. Tuberculosis of the peritoneum was often cured by removal after laparotomy.

CANCER OF THE TONGUE.

Of the ninety-one cases of tongue cancer upon which KRAUSE (*Deutsche medicin. Woch.*, No. 22, 1889) has operated, there were but two deaths which could be traced immediately to the operation, nor were either of these due to extension of inflammatory processes into the neck and mediastinum. This is in striking contrast not only to the figures of Billroth, whose mortality is 22.5 per cent., but even to those of Kocher, who by preparatory tracheotomy and tamponade reduced his mortality to 7 per cent. Krause avoids preparatory tracheotomy and tamponade as being in itself an element of danger, and needlessly complicating the operation, nor does he admit that splitting of the cheek is of the slightest service, the room gained by this procedure never being of sufficient importance to justify the incision.

Krause operates with scissors and knives, and employs but two methods; the choice of these depends upon the position, size, and extent of the growth. If, by means of tenacula and strong wire passed through the tongue, the growth can be drawn to or beyond the dental arch, a resection is made by means of the knife, or scissors. The patient being seated upright in a chair, the blood flows away from the pharynx and is in no danger of being drawn into the lungs. After the bleeding is checked the mucous membrane can be at once brought together, or, if there is a long strip of healthy tongue left, this can be carried around and so sutured that a short but broad organ is left. If the carcinoma extends so far posteriorly that strong traction is not sufficient to bring it near the dental arch, or if it has involved the floor of the

mouth or the tonsils, then the parts can best be exposed by dividing laterally the submaxillary bone.

The patient is placed upon the table in an almost sitting posture, a traction thread is passed through the tongue and the latter is drawn forcibly forward. The lower canine or first molar tooth is then drawn, after which an incision is carried directly downward from the corner of the mouth to the larynx, dividing the periosteum of the lower jaw, but made much more superficial in the neck. The periosteum on the inner surface of the lower jaw is now pushed aside sufficiently to allow a broad iron lever to be passed upward till it rests upon and protects the upper lip. The jaw is divided upon this lever by a thin, broad-bladed amputation saw cutting obliquely backward, a strong resection hook is placed in each opening of the exposed infra-maxillary canal, the two portions of bone are drawn forcibly apart, and the soft parts forming the floor of the mouth are divided in a line with the first incision. Sufficient room is given for readily securing all bleeding vessels. The palato-glossal fold is divided, and a drainage-tube the size of the little finger is placed in the tonsillar fossa and curved to the lower portion of the neck incision. Thirty-five operations performed in this way gave but one death, due to lobular pneumonia.

In completing the operation the fresh surfaces should be covered by mucous membrane as far as this is possible, and the bone should be held together by silver wire. Frequently the sawed surfaces of bone perish, thus delaying healing, but this is never a serious complication.

The after-treatment consists in keeping the patient in a half-reclining posture, giving him liquid diet by means of a long glass tube extending far back into the mouth, and carefully irrigating the oral cavity after each meal with a three per cent. boracic solution.

As far as recidivity is concerned, it must be conceded that the prognosis of cancer of the tongue is particularly bad. Of twenty-nine cases operated upon by the second method, consequently the most serious cases, one is still living (six years) and with no return of trouble, one remained free from recidivity for a whole year; he finally perished three years after the operation from a return of the disease. The average period of life after operation was one year.

Of thirty-seven partial tongue extirpations without section of the maxilla, three have survived without recidivity for more than three years after the operation. The diagnosis of all these cases was confirmed by careful and skilled microscopic examination.

LORETA'S OPERATION FOR CICATRICIAL STENOSIS OF THE PYLORUS.

MR. FREDERICK TREVES reports as follows (*British Medical Journal*, May 18, 1889) the steps of an operation for digital dilatation of the pylorus in a case of non-malignant stricture occurring in a woman fifty-one years of age:

A vertical incision four inches in length was made in the abdominal wall in the median line. The lower end of the cut reached as far as the umbilicus. The greatly dilated stomach was at once exposed. The pylorus was at first difficult to define. It appeared to be imbedded in a mass of almost cartilaginous hardness, which was firmly adherent to the under surface of the liver.

Not only was the actual pyloric extremity of the stomach adherent to the liver, but a portion of the viscus itself, to the extent of some three square inches, was in like manner attached. It was evident that the adhesions were inflammatory, and that they were especially tough and thick in the region of the pylorus. They were divided as freely as was possible. The segment of the liver to which they were attached was pale and had the appearance of being atrophied. It was found impossible to quite free the pylorus and to separate the stomach entirely from its attachment to the liver. A vertical opening was then made into the stomach midway between the two curvatures and about two inches from the pyloric orifice. The pylorus was surrounded by a ring of very dense tissue and appeared to be set in cartilage. It would not take the point of the forefinger. The pylorus was steadied with the left hand while the operator gradually bored with the right forefinger into the constricted orifice.

The process of dilatation was slow, but in time the finger was introduced into the duodenum. Without withdrawing the finger from the stomach the wound in the viscus was enlarged with a bistoury held in the left hand, and the middle finger was passed into the stomach.

The wound even now was small, and the fingers were closely embraced by the gastric wall. Under such conditions hemorrhage was scarcely possible. The middle finger was passed through the pylorus and the forefinger inserted slowly after it. In a little while the orifice was sufficiently dilated to take the two fingers. During the process the pylorus was steadied by the left hand. This dilatation appeared to be quite sufficient, because an orifice admitting the two fingers together would have a circumference of about four inches. Loreta is reported to dilate the pylorus with the two forefingers until they are more than three inches apart. This would represent an opening with a circumference of not less than seven inches. Had dilatation to this extent been attempted in the present instance the walls of the viscus would certainly have been ruptured.

The wound was closed by a continuous fine silk suture and by Lembert's suture. The patient recovered, and was well two years after.

KINNICUTT and BULL report (*Med. Record*, June 8, 1889) another case in which Loreta's procedure of stretching was successful in curing a cicatricial stenosis of the pylorus. The patient gave a history of frequent vomiting; showed, on physical examination, an enormously dilated stomach, and secreted regularly a subnormal amount of hydrochloric acid. He was prepared for operation by emptying the bowels by enemata for two nights, and by washing out his stomach immediately before the administration of an anæsthetic. The incision was made from one-half inch below the ensiform appendix to the level of the tenth costal cartilage. A two-inch incision was made in the anterior wall of the stomach at a distance of two inches from the pyloric orifice; half a dozen catgut ligatures were required to stop the bleeding. The pylorus admitted a No. 20 French bougie. It was slowly and carefully dilated until the two index fingers could be inserted and separated for half an inch. A continuous catgut suture closed the mucous membrane, while the peritoneum was brought together by twenty Lembert sutures.

Rectal enemata were given for forty-eight hours; then ice, beef-tea, and milk by the mouth.

Bull tabulates eighteen cases, with twelve recoveries and six deaths. Only one of these deaths was directly traceable to the operation. In this case there was bleeding into the stomach.

Bull presents a letter from Loreta, who states that of the last seven cases operated upon by him two perished, one from hemorrhage due to escape of blood from the edges of the gastric incision; one from peritonitis caused by an unnoticed rupture of the peritoneum which occurred during the stretching of the pylorus.

EXPOSURE OF THE PROSTATE AND BASE OF THE BLADDER BY PERINEAL INCISION.

ZUCKERKANDL (*Wien. med. Presse*, Nos. 21 and 22, 1889) describes a new incision for operative procedure requiring access to the base of the bladder and the prostate gland. The patient is placed in the lithotomy position, and a two and a half inch incision is made transversely across the perineum, a little over an inch in front of the anus. From the two extremities of this cut the knife is carried backward and somewhat inward toward the middle line for an inch and a quarter. This flap is dissected up until the prostate is exposed, it is then turned back, carrying the anus and rectum with it, and exposes the trigone, vasa deferentia, and seminal vesicles. By drawing the rectum backward the peritoneum is put upon the stretch, and can readily be pushed up, so that the whole posterior wall of the bladder is subject to careful examination.

The advantages of this method are:

1. By an incision which divides only skin and superficial fascia, the fundus and posterior wall of the bladder are rendered accessible.
2. The bladder is so exposed that removal of tumors seated in its posterior wall is peculiarly facilitated.
3. The operation is entirely extra-peritoneal.
4. The portion of bladder exposed is that for which bladder tumors have a distinct predilection.
5. The position of the wound secures perfect drainage.

Langenbuch's method of reaching the bladder in the pubic angle, below the symphysis, is open to the objection that sufficient room is not given for operative procedures, the prostatic plexus of veins is subject to lesion, and drainage is no better than in the high operation.

Niehaus (*Centralblatt für Chirurg.*, 1888, 29) exposes the lateral walls of the bladder by a temporary osteoplastic resection.

Helferich makes a very free exposure of the anterior bladder wall by a partial resection of the symphysis.

Koch removes a quadrilateral piece from the symphysis.

Rydygier recommends laparo-cystotomy, with subsequent suturing of the peritoneal bladder incision.

Whatever the method by which the bladder is reached, if its wall is found infiltrated with malignant growth the entire affected part should be resected. Sonnenberg has successfully resected two-thirds of a carcinomatous bladder, and the only excuse for any operation directed against the tumor is that it shall be radical.

SUPRAPUBIC PROSTATECTOMY.

MR. BUCKSTON BROWNE reports (*British Medical Journal*, May 18, 1889) a case which he believes to be interesting, because: 1. The amount of prostatic tissue removed was the largest on record. 2. The patient was of such advanced age. 3. His sufferings were of such severity. 4. The relief afforded was so complete.

On March 7, 1889, the patient was seen in consultation. He was eighty-seven years old, and was suffering from intense vesical irritation. The catheter was imperatively called for every hour, and his screams from vesical spasm were heartrending, in spite of the free administration of morphine. At 9 P.M. ether was administered, and the bladder opened suprapubically. On entering the bladder the cause of the patient's sufferings was at once apparent; not a particle of calculus was found, but growing from below, and from the right side of the vesical urethral orifice, was an enormous prostatic growth. It was removed piecemeal by finger and forceps, the only difficulty being, at first, in getting through the prostatic capsule; when once that was opened, the lobules of the growth shelled out easily, and were removed by torsion, no cutting or tearing being employed. The whole, when removed, weighed nearly four ounces; when all was cleared away, the urethral orifice was level with the adjoining vesical surface, and its upper and left portions intact.

There was hardly any bleeding, and the operation was followed by very little constitutional disturbance, and by complete vesical relief. On the sixteenth day the patient sat up. He was fitted with a suprapubic plate and tube designed by the author, which enabled him to dress and walk about, and was so comfortable that it was not thought well to allow the suprapubic wound to heal.

 THE TREATMENT OF URETHRAL STRICTURE.

DR. E. L. KEYES considers (*Medical Record*, May 25, 1889) the question of the radical cure of deep urethral stricture, and arrives at the following conclusions:

1. There are three forms of organic deep urethral stricture: The superficial linear fibrous, with inflammatory and spasmodic complications (which he calls the soft stricture); the purely cicatricial fibrous stricture; and the inodular stricture, in which there is development of new inodular tissue over and above the true fibrous cicatricial element.

2. Soft strictures are occasionally (but by no means always) capable of radical cure by dilatation—and the addition of mild electrolysis does not prevent this cure by dilatation.

3. Pure linear fibrous stricture, especially if traumatic, and occurring in patients who have never had gonorrhœa, may sometimes be radically cured by thorough longitudinal division of the stricture on the roof as well as on the floor of the canal, and by a maintenance of the cure for a moderate time by the occasional passage of very large sounds. I beg to reserve final opinion on this point for a future communication.

4. Inodular stricture does not seem to be radically curable by this method.

5. It seems possible that inodular stricture may be radically cured by a total excision of all the morbid tissue and suture of the healthy divided ure-

thral ends; or, in cases where extensive loss of tissue makes such approximation impossible, by the transplantation (Wolfler's method) of strips of healthy mucous membrane derived from an outside source.

DR. A. W. STEIN (*Ibid.*) formulates as follows some opinions as to the treatment of urethral stricture: Gradual dilatation is the safest method, and most strictures yield to it promptly. Internal urethrotomy is rendered safer by previous dilatation. Strictures are apt to be unyielding and resilient in proportion to their nearness to the meatus. The danger of internal urethrotomy increases with the distance from the meatus. External division is to be preferred to the internal in all strictures requiring incision that are accessible from the perineum. Strictures of large calibre may be cut with less risk of "inconvenience" than in the case of tight strictures. Divulsion is to be "relegated to the dark ages." Urethral fever, in the majority of instances, is a vaso motor disturbance of reflex origin, and not the result of urinary or other infection. As to ultimate results, thorough dilatation compares most favorably with urethrotomy.

THE SURGICAL TREATMENT OF SPINA BIFIDA.

DR. CARL BAYER (*Prager med. Wochen.*, No. 20, p. 227) reviews the treatment of spina bifida recommended by other authors, and rejects the use of the seton, the injection of iodine, and the excision of a portion of the sac, as being at the same time unsatisfactory and dangerous. He urges that the condition is one analogous to hernia, and should be treated in a somewhat similar manner; that the danger of meningitis in the one case is no greater than the danger of peritonitis in the other, and that as compared with the operation above-mentioned, it is both safer and more radical. In a child, ten days old, in which there was a large meningocele of the size of an apple, and who had already developed bed-sores, he performed the following operation:

The child was chloroformed, and the region of the bed-sores cleaned and rendered aseptic. Two lateral flaps were made from the skin covering the tumor and were dissected down to its pedicle. The child was turned on its belly in order to avoid excessive loss of cerebro-spinal fluid, and the sac of the meningocele was opened. The cauda equina was seen flattened out upon the posterior wall of the sac. It was loosened after dilatation of the incision, although in effecting this a slight laceration occurred on account of inflammatory adhesions. Two small arteries were ligated at the end of the cauda. No alteration of pupils and no spasm of the extremities were noticed. The cauda was replaced in the spinal canal, and the sac of meningocele was removed, leaving only two lateral flaps of the dura, which were sewed together after thorough antiseptic cleansing of the wound. The muscles and skin were afterward brought together separately. The child recovered completely.

Bayer suggests that possibly in the future through a greater development of the technique of the operation, a bony roof over the sewed sac may be produced by forming two lateral periosteal flaps from the canal of the sacrum.

TREPHINING FOR FRACTURED SPINE.

Two cases of trephining for fracture of the spine are reported by ALLINGHAM (*Lancet*, June 1, 1889).

The first case exhibited paraplegia and girdle pains, together with retention of urine immediately after a fall, but with no noticeable deformity about the back. In five weeks urine began to dribble away unconsciously, the bladder sometimes being empty on the passage of a catheter, or containing an ounce or two of fluid; temperature rose, and line of loss of sensation was perceptibly higher. Ascending and descending changes were evidently taking place; therefore, in hope of relieving pressure, the spine was trephined. On incision the laminae of the sixth vertebræ were found to be badly fractured and pushed up beneath the laminae of the vertebra above. The cord was completely exposed for four inches; it looked rather bruised, but pulsated freely. The theca was not opened. The wound healed *per primam*. There was some slight but decided improvement at first.

The next case entered the hospital with the history of a broken fall of about forty feet; she was collapsed, paralyzed, and anæsthetic over the lower part of the trunk and lower extremities, and the breathing was mainly abdominal. A distinct prominence was found on examination, corresponding with the fourth and fifth dorsal vertebræ. There was retention of urine and abolition of epigastric and abdominal reflexes. Five days after the accident, as there was no improvement, chloroform was given, and an incision was made which showed that the laminae of the fourth dorsal vertebra were badly shattered. The spinous processes of the third, fourth, and fifth dorsal vertebræ were removed, when it was seen that the cord was much bruised, and that a spicula of bone projected from the right side of the fourth vertebra, the cord pulsating down to this point, but not beyond it; the cord pulsated below upon the spicula being removed. The theca was opened to allow the evacuation of any blood clot. The wound healed kindly, but the patient did not in any way improve.

Allingham believes that these cases teach the following facts: 1. That by trephining it is evident that inflammatory ascending changes are prevented. 2. That no bad symptoms follow from opening the spinal dura mater and allowing the cerebro-spinal fluid to flow out. 3. The operation, although tedious, is not a difficult one to perform, and does not in any way diminish the chance of recovery.

Hemorrhage is easily controlled, and the wound heals quickly.

ENCHONDROMA OF THE SCAPULA.

A remarkable case of enchondroma of the scapula is reported by v. EISELBERG (*Wiener klin. Wochenschr.*, No. 15, 1889). It occurred in a widow, aged fifty-one years. Six years before, her right shoulder was injured and for a year after motion was restricted. Five years ago she noticed a hard, painless tumor the size of a walnut situated upon the right acromion. This increased in size slowly till one year ago, when the growth became very rapid. At present it not only inconveniences the patient by its enormous size, but is also accompanied by violent pain, felt at its lower portion. The tumor occupies the whole of the anterior lateral and posterior region of the right chest, entirely concealing the scapula in its mass. Circumference of the right chest at the base of the angle of the scapula, forty and a half inches. Measurement of the left chest at the same level, nineteen inches. The tumor is

slightly movable upon the thorax, and is covered by normal, non-adherent skin in which veins as thick as the finger can be plainly seen and can be felt to have grooved for themselves channels in the hard tumor. At some points fluctuation can be detected. The right arm is somewhat wasted and is abducted by the huge tumor placed beneath it; there is, however, no fixation at the shoulder-joint. Radial pulse can be plainly felt. There is a compensatory left scoliosis of the dorsal vertebræ.

At the earnest solicitation of the patient Billroth operated upon her. To avoid excessive hemorrhage, all the branches which supplied the tumor with blood were ligated near their origin from the subclavian. Two finger-breadths above the middle of the clavicle an incision was begun and carried downward and outward in the deltoideo-pectoral fold as far as the surgical neck of the humerus. The middle third of the clavicle was resected, the scalenus anticus was divided, and the subclavian artery was freely exposed. Ligatures were applied to the ascending cervical, internal mammary, transversalis colli, transversalis humeri, acromio-thoracic, subscapular, and circumflex arteries, all of which were somewhat enlarged. At the lower and outer extremity of the wound the axillary vein was tied. After provisional tamponade of this wound with iodoform gauze, an oblique incision twenty inches long was carried across the greatest circumference of the tumor, and an effort was made to tear it loose from its connections. This caused the rupture of a large cyst from which several quarts of a clear serous fluid were discharged. All connections except those to the scapula having been loosened, the latter bone was so cut through with bone-forceps that the glenoid cavity, the coracoid process, and the extremity of the acromion were left in the wound. After carefully checking the moderate bleeding and removing a large flap from the now redundant skin, two small strips of iodoform gauze were laid in the neck wound; both wounds were then sutured, after amply providing for drainage by means of thirteen tubes; and the dressing was completed by iodoform gauze, vegetable fibre, and a pressure bandage.

The patient was somewhat collapsed; reacted promptly, however, to gentle stimulation. In the night she had a semi-solid dark-brown passage. The following day she became delirious, and this continued with slight intermissions till her death, which occurred on the evening of the seventh day after the operation. This delirium maintained the same form throughout; the same few words were shouted for hours at a time. The temperature was not materially elevated, but the pulse was rapid. Wine, tea, soup, and milk were freely taken. Considering the possibility of either sublimate poisoning or iodoform intoxication, the dressing was changed on the second day, the iodoform was substituted by aluminium acetate, and the drainage tubes were washed out with sterile salicylate solution. Four times the dressing was changed; the wound showed no reaction at any time, nor was there any profuse discharge through the tubes. Oxygen inhalations revived the patient somewhat, and she made violent efforts to push away the inhaler. No decided improvement in her condition was produced by these inhalations. Though the wound appeared in every way aseptic, septic infection was suspected. Agar cultures confirmed this suspicion, the staphylococcus aureus being found in all the test tubes inoculated with blood from her finger.

On section the connective tissue surrounding the brachial plexus was found

infiltrated with a reddish-gray pus, the ligated veins were filled with black-red thrombi, and in the depth of the wound the suppuration had extended to the apex of the pleura. In the large dorsal wound there was very slight suppuration; heart somewhat fatty; stenosis of coronary arteries; some duodenal ulcers.

The tumor was elliptical in form, greatest diameter eighteen inches, lesser fourteen inches. It contained a cavity with a capacity of seven to eleven pints, and it weighed, after evacuation of its fluid contents, thirty-one pounds.

HÆMARTHROSIS.

DELBASTAILLE (*Bull. de l'Acad. Royale de Méd. de Belg.*, No. 11) has repeated on dogs the experiments of Henriett and Riedel, by injecting the knee-joints with blood and producing, either immediately before or immediately after the injections, different lesions in the joints, such as fractures, contusions, penetrating wounds, etc. He came to the following conclusions:

1. Large quantities of blood placed in sound knee-joints are fully absorbed in three weeks, leaving behind at the most a little staining of the synovial membrane. The animals could run well from five to eight days after the injection.

2. If the injection closely precedes or follows the wound of a joint, the result is very different, according to the nature and extent of the lesion. In an incomplete, non-penetrating patellar fracture the absorption is delayed for about sixteen days. A similar delay occurs after bruising of a joint, and is still more marked after penetrating fractures, tearing of tendons, etc. The coagula then undergoes all the changes of organization, and as a result there is limitation of motion and ankylosis.

3. The immobilization of a joint filled with blood retards the absorption.

4. If an aseptic, foreign body, such as a piece of drainage tube, is placed in the joint before it is injected, absorption occurs more quickly. He believes that the synovial irritation accounts for this.

5. If one adds to the blood injected into the joint some synovial fluid from the cow, this quickened absorption does not occur.

OTOLOGY.

UNDER THE CHARGE OF

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AN INJURY OF THE AURICLE, LEADING TO PERIOSTITIS OF THE MASTOID.

A man, twenty years old, was lifted by his auricle. He soon experienced intense pain behind the auricle, followed by swelling behind, and œdema in front of the ear, and beneath the eyelids, with fever. The swelling behind

the ear was punctured with a bistoury, and some drops of pus escaped. Recovery ensued in fifteen days. (DR. THOMAS BARR, *Edinburgh Medical Journal*, Jan. 1889.)

FRACTURE OF THE MEMBRANA AND OF THE EXTERNAL AUDITORY CANAL.

This was observed in a woman, fifty years old, who had inserted a pin into her ear. Fruitless efforts were made to extract it. Examination revealed a small prominence at the lower part of the frame of the drum membrane.

This prominence was extracted by unskilful hands, and proved to be, not the pin but "two little bones."

The explanation of this case, as rendered by DR. BARR (*Edinburgh Medical Journal*, Jan. 1889), seems to be that "the pin never entered the auditory canal, but fell from the patient's hands to the floor. The physician who first examined the ear, being misled by the patient's fear and erroneous impressions, believing he saw the pin seized the border of the annulus tympanicus, and by his undue efforts at extraction of the supposed pin, fractured the bone.

WOUND OF THE MEMBRANA TYMPANI BY A TWIG.

DR. E. MÉNIÈRE gives an account of this not very common accident (*Annales des Maladies de l'Oreille*, May, 1889). A gentleman, in hunting, forced violently the twig of a lilac bush into his right ear. Immediately he experienced severe pain and a metallic ringing sound in his ear. The latter sound gradually faded away after lasting some seconds. The patient also became dizzy and confused in his head, and so deaf as not to hear the report of guns near him. A little later the direction of sounds was altered so that sounds on his *left* side appeared far off and from the opposite side. The sharp pain in the ear ceased, but the confusion and the buzzing in the head and ear continued, even appearing intensified when in the cars and in the noisy streets of Paris, after the patient's return home. At the time of the accident some blood came from the ear, and for a week afterward the cotton which was kept in the meatus was stained with blood and yellowish serum. There seems to have been no suppuration.

For four days there was great sensitiveness to all sounds, and the patient remained in his room. In the course of a week all discharge of blood and serum ceased. But the patient remained deaf and then sought the advice of Dr. Ménière.

The latter saw the patient for the first time about two weeks after the accident. A round perforation was found in the inferior part of the right membrana tympani. There was a slight mucous deposit in the drum cavity, but no purulent discharge. The edges of the perforation were sharply defined, the perforation being three millimetres in diameter. The membrana was very slightly hyperæmic. After having cleaned the canal and the drum-cavity with an antiseptic wash, the canal was tamponaded with boric acid cotton. Under this form of treatment the perforation healed and the hearing became nearly normal in the course of a month.

The sudden deafness in the uninjured ear is explained by the synergic

action of both *tensores tympanorum*, and of binaural sympathy. Such phenomena have already been noted by Gellé in the course of his studies in experimental physiology.

MYCOSIS IN THE HUMAN EAR.

DR. F. SILBERMANN, of the University of Basel, has written a brochure on the above named subject. The various forms of fungus are considered. The *aspergillus nidulans* is mentioned for the first time as occurring in the human body. This fungus resembles in form and size the *a. fumigatus*. Its sterigmata are branched instead of being single stems. The treatment recommended by the author is the instillation of a two per cent. solution of salicylic alcohol for a week. (Bezold: *Münchener med. Wochenschrift*, April, 1889.)

CHOLESTEOTOMA OF THE MIDDLE EAR.

DR. J. HABERMANN thus explains the pathogeny of cholesteotoma of the middle ear (*Archiv für Ohrenheilkunde*, Bd. 27).

This author had occasion to study the mode of development of cholesteotoma in the cadaver of a man who had died of meningitis consecutive to otitis media. The man had suffered with a purulent otorrhœa from childhood. This inflammation finally healed in the tympanum but continued in the mastoid cavity. In the latter the suppuration induced an ulceration in the mucous membrane. This ulceration also healed finally and became covered with epidermis. Finally, the horny cells of this latter being renewed without cessation, and those which became detached not finding an escape, little by little an accumulation of horny cells was formed in the mastoid cells, and thus was developed the cholesteoma. This explanation is based upon a histological examination of the lesions; no other theory can give as satisfactory an explanation. The author claims that many other cholesteotomata may be explained in the same way. (*Annales des Maladies de l'Oreille*, April, 1889.)

SCARLATINOUS OTITIS.

DR. CHARLES H. MAY, of New York, read an interesting and valuable paper on this subject, in the Pediatric Section of the New York Academy of Medicine, March 16, 1889 (*American Journal of Obstetrics*, April, 1889). The paper begins with some interesting data upon the frequency of aural disease in, or as a sequel of, scarlatina. Thus Bader, quoted by Burkhardt-Merian, observed its occurrence in thirty-three per cent. of all cases in one epidemic, and twenty-two present in another. Other observers are quoted who found the percentage lower, viz., four and one-third to five and a half. It is stated that ten per cent. of deaf-mutes owe their loss of hearing to scarlatina.

"There was a time, many years ago, when the discharge of scarlatinal otitis was looked upon as a favorable means of ridding the system of scarlatinal virus; but the days of such erroneous pathological ideas are past; the reason for inactivity in the treatment of scarlatinal otitis by the general practitioner probably is that he regards the achievements of otology as doubtful and unsatisfactory. Though this may be the case in some affections of the

ear, in the group of cases comprised under the title of this paper, aural therapeutics are capable of producing the most happy results; and there is no doubt that the active treatment of these cases by the general practitioner during the course of scarlatina, would do much to diminish the large percentage of those who owe a serious defect in hearing, or total deafness, to the effects of this disease. We should also remember that no patient is safe who suffers from chronic purulent otitis media; for we can never be certain when the disease will extend to neighboring parts, and when serious or fatal results, such as meningitis or cerebral abscess, will ensue."

The author adheres to the view that the severer forms of scarlatinous otitis are due to a diphtheritic otitis media, and this even in cases in which diphtheritic patches cannot be seen in the throat.

"At first, all forms may be treated alike. With the occurrence of pain in the ear, tenderness, deafness, and other symptoms indicating an extension of inflammation to the middle ear, a long, narrow ice-bag should be applied so as to cover the region immediately behind the auricle, and curving around the lower end of this organ upon the temporo-maxillary region." Flannel should be placed between the auricle and the ice-bag. Tincture of iodine painted over the skin of the mastoid is said often to act well. If cold is not borne well, then the auricle should be entirely covered with cloths wrung out of very hot water, over which cotton and then oiled silk, are placed. To ease the pain, instillations of hot salt water (three-quarters of one per cent.) may be used in the ear, or may be syringed in by the fountain syringe.

Antipyrin or an opiate may be given to ease the pain. Rest in bed is essential. Local bloodletting is recommended by the author, but we should not approve of wounds in the skin near the ear in diphtheritic cases. If the severe symptoms do not disappear under the above treatment, then it is recommended to perform paracentesis of the membrana, "even where there is no physical evidence of anything but congestion of the drum-membrane."

When diphtheritic patches are observed in the drum-cavity, through the perforation in the membrana, the advice of Burckhardt-Merian is to be followed, viz., cauterization of the patches by a ten per cent. solution of salicylic acid in alcohol, by means of tufts of cotton on the cotton-holder. This is painful and with the tendency to vomit, which it causes, must be controlled by allowing the patient to suck bits of ice.

The auditory canal must be syringed several times daily with a solution of salicylic acid made in the proportion of one or two teaspoonfuls of a ten per cent. alcoholic solution in one hundred grammes of water. A solution twice this strength is used for gargling. Pilocarpine injections, in cases of affection of the auditory nerve are of doubtful utility.

LABYRINTHINE DEAFNESS TREATED BY PILOCARPINE.

Eighteen cases of labyrinthine deafness have been reported as treated by hypodermatic injection of pilocarpine (St. Mary's Hospital, London, under the care of Mr. Field, *British Medical Journal*, March, 1889). In these cases the vibrating tuning-fork on the mastoid was not heard, as bone conduction was a minus quantity. They were subjected to daily hypodermatic injections of pilocarpine, according to the method of Politzer. The number of them

ranged from twenty to forty. The treatment began with injections of an eighth to a tenth of a grain, gradually increased in some cases, up to a quarter of a grain. Sometimes a few drops of a weaker solution were passed up the Eustachian tube, by the catheter. This is supposed to be indicated when the middle ear is affected, as well as the labyrinth.

After these injections the patients were either kept in bed for two hours or ordered to lie down in a warm room for at least an hour and a half. The effect on the heart was carefully watched. The treatment was not continued longer than ten days, if no improvement occurred, as shown by the tuning-fork and other tests. Weakness, excessive salivation, palpitation, throbbing tinnitus, giddiness, and impaired vision were taken as signs for either lessening the dose or discontinuing the treatment altogether. Only those cases were selected for treatment which manifested impaired or nullified bone conduction, as measured by the vibrating tuning-fork. In some cases the onset was sudden, in others gradual. Middle ear disease existed in some cases; the ages varied as did the assigned cause. The results were exceedingly good in some cases, in others bad or indifferent.

LESION OF THE LABYRINTH FROM A BLOW ON THE HEAD; RUPTURE OF THE MEMBRANA TYMPANI.

Immediately following the blow on the head, the patient fell to the ground, lost consciousness, and there ensued hemorrhage from the left ear and the nose. The bleeding from the ear lasted two days. Examination revealed a perforation in the posterior part of the membrana. Finally the patient became deaf, suffered from tinnitus and headache, without otitis media. He instituted a suit for damages. The tuning-fork on the vertex was heard best in better ear, which fact seems to demonstrate a lesion in the auditory nerve in the affected ear. (Dr. Barr: *Edinburgh Medical Journal*, 1888; *Annales des Maladies de l'Oreille*, May, 1889.)

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF
J. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

THE LARYNX IN ENTERIC FEVER.

In an interesting discussion on this topic at the Laryngologische Gesellschaft zu Berlin, March 15, 1889 (*Deutsche med. Woch.*, June 6, 1889), DR. LANDGRAF reported his observations in 166 cases. In many of them, even in cases terminating fatally, there had been no pathological manifestations whatever at any period. The most frequent manifestation was partial congestion, apparently due partly to stasis and partly to flux, but without increased secretion as in

measles or in ordinary catarrh. This was followed by partial shedding of the epithelium, sometimes without erosion. In some instances yellowish or grayish patches were seen, due to mycoses, bacterial investigations of which revealed no typhus bacilli, but only the golden and yellow pyogenic staphylococci. Œdema was a second sequel in some cases. When it took place in the epiglottis the mucous membrane sometimes underwent rupture, and ulcers formed on the borders of the epiglottis. As had long ago been recognized by Louis, these are of considerable value in diagnosis. They had no prognostic significance, however, and usually healed, even in fatal cases. Another variety of ulceration, of more significance in prognosis, was developed from destruction of the mucous membrane, and occurred not only in the epiglottis but elsewhere, being sometimes associated with perichondritis. Less frequently were found ulcers which, from their period of occurrence, the infiltration of their bases, and the undermining of their edges, may be designated as specifically typhoid ulcerations.

DR. LUBINSKI had noted catarrh most frequently, usually in the first or second week. This was characterized less by secretion than by arterial hyperæmia with or without ecchymoses. Erosions, often superficial, were not infrequent; especially over the vocal processes and in the interarytenoid fold; and still more frequently and deeper-seated on the borders of the epiglottis, so that the edges of the cartilage became exposed, especially in the presence of intense œdematous tumefaction. He, too, considered these erosions of the epiglottis as characteristic, and had often found loss of the cartilage—which, persisting years afterward, indicated the nature of the lesion. True typhoid ulcers he had noted chiefly in the adenoid regions, the inner surfaces of the arytenoids, the ventricular bands, and the base of the epiglottis. He believes these to be due to destruction of typhoid infiltrate, in accordance with the opinion of Rokitsky and of Eppinger. These are often associated with perichondritis. The mycotic epithelial necrosis he had observed at a later date, say the fourth or fifth week, usually when complications occurred in the respiratory apparatus. He believed that the mycosis sometimes penetrated the mucous membrane, reached the cartilage, and destroyed it. He had seen an arytenoid cartilage coughed out. He had also noted paralyses in the latter half of the attack, once confined to the larynx, but usually in association with pharyngeal and palatine paralysis. He mentioned an instance of right-sided paralysis of the posticus, which was not relieved until three months after convalescence. In another instance there was bilateral paralysis, with the vocal band in the cadaveric position.

DR. G. LEWIN called attention to the fact that the cricoid cartilage suffered the most frequently in typhoid fever, while the arytenoids suffered most in tuberculosis and in syphilis. He attributed this to anatomical and physiological causes. In syphilis and in tuberculosis the arytenoids were in frequent and complicated movement in phonation, in deglutition, in forced inspirations, and in cough; and thus slight lesions were readily excited through which microbes penetrated into the mucous membrane, and into these cartilages. In enteric fever the soporific condition of the patient favors accumulation of secretions which are not coughed out, and these remain on the broad cricoid cartilage, undergo destruction, and form a nidus for septic microbes; microbes which are not specific typhoid bacilli. He had found the adenoid regions

less frequently attacked than other regions, and attributed the ulcerations to vaso-motor and impaired trophic influences, those functions being in abeyance which favor circulation of the blood. The symmetry of bilateral processes pointed in part to trophic changes central in origin; though the lesions were regarded by him as lesions of trophic perineuritis, due to pressure upon the cricoid cartilage, as advanced by Ruhle, and before him by Dietrich (1850). He coincided with the former speakers that there was no real catarrh of the larynx in typhoid fever. Of 84 cases in which he had noted perichondritis, 4 occurred in the first week, 7 in the second, 3 in the third, 10 in the fourth, 8 each in the fifth and sixth, 4 in the seventh, 4 each in the eighth and ninth, and 1 each in the twelfth and thirteenth.

In 18 the arytenoid cartilage alone was involved, in 27 the cricoid alone, in 4 the thyroid alone, in 17 arytenoid and cricoid, in 1 arytenoid and thyroid, in 5 cricoid and thyroid, in 3 the epiglottis alone, in 2 epiglottis and thyroid, in 1 epiglottis, thyroid, and cricoid, and in 2 epiglottis and cricoid.

As to the results of tracheotomy, he had utilized 101 cases with the following summary:

Cured, that is to say the patients did not die in the immediate future, 23 per cent.; dead within fourteen days after operation, 37 per cent.; dead without having the tracheotomy performed, 36 per cent.; spontaneous recovery without operation, 4 per cent.; result undetermined, 1 per cent.

OBSTETRICS.

UNDER THE CHARGE OF

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CHLOROFORM DEATHS IN OBSTETRIC PRACTICE.

CHARPENTIER (*Bull. de la Soc. Obstét. de Paris*, No. 5, 1889) in a discussion on obstetrical anæsthesia before the Obstetrical Society of Paris, quotes the researches of Duterte, who collected forty cases of death attributed to chloroform. He eliminated thirteen of these in which another adequate cause of death was present. But very few of the remaining twenty-seven were free from pulmonary or cardiac disease, and chloroform had been given to the extent of complete or surgical anæsthesia in these cases; in quantities sufficient to produce obstetrical anæsthesia it is very rarely dangerous.

THIGH PRESSURE TO CORRECT FETAL MALPOSITIONS.

KING (*American Journal of Obstetrics*, June, 1889) believes that pressure of the flexed thighs upon the antero-lateral regions of the abdomen produced by postures, especially squatting, is an efficient factor in preventing and rectifying foetal malpositions. His belief is illustrated by photographs of

the living subject in these positions, and photographs of statuary; he finds corroborative evidence in the customs of primitive people.

THE MECHANISM OF THE SEPARATION AND EXPULSION OF THE PLACENTA.

ZINSSTAG (*Archiv für Gynäkologie*, Band 34, Heft 2) concludes from clinical observations on this subject that the placenta separates as Duncan has taught, beginning at the edges without a retro-placental hæmatoma; this process is favored by absence of traction on the cord; it is not advisable, however, to cut the cord early to avoid traction upon it.

The fact that the retro-placental hæmatoma is an accidental and not an inevitable factor in placental separation is shown by the membranes, which were drawn over the foetal surface of the placenta, empty of blood, in 47.9 per cent. of cases in which Duncan's theory of separation was exemplified; in 52.1 per cent. of cases in which the membranes were upon the uterine surface of the placenta they contained no blood.

Zinsstag believes that Credé's method of expressing the placenta results in smaller loss of blood and less frequent retention of placenta and membranes.

THE EXPECTANT TREATMENT OF THE THIRD STAGE OF LABOR.

AHLFELD (*Centralblatt für Gynäkologie*, No. 15, 1889) reports the results of his expectant method of treatment of the third stage of labor in 304 cases. In 249 cases the placenta was expelled before the expiration of one and a half hours; the loss of blood in these cases averaged twelve ounces. When the placenta was expelled earlier the blood loss was greater. In only 21 cases did the hemorrhage reach two pints.

No ergot and no hot intra-uterine douches were given. Uterine massage, and in one case a cold vaginal douche were the only means used to prevent hemorrhage and expel the placenta.

SEVERE PUERPERAL HEMORRHAGE SUCCESSFULLY TREATED BY IODOFORM GAUZE TAMPONS.

BORN (*Centralblatt für Gynäkologie*, No. 25, 1889) reports six cases of severe puerperal hemorrhage which resisted other modes of treatment, but yielded to tampons of iodoform gauze. In five of these cases laceration of the cervix, in greater or less extent, was present, and was promptly closed by suture; the closure of the laceration was without effect upon the hemorrhage. Uterine injections of creolin, uterine massage, and ergot were also without result.

The gauze was kept in tin boxes, and was prepared in strips two feet long and four inches wide. A flexible applicator one-twelfth of an inch in diameter and notched at the distal extremity was used. The end of a strip of gauze was caught by the notch in the applicator and carried to the fundus of the uterus, the outer extremity remaining in the vagina. The presence of a single strip of gauze in the uterus usually sufficed, but others may be introduced if needed. The vagina was then tamponed with the same material. The gauze was removed in from thirty-six to forty-eight hours after application, and in no case was odor or evidence of decomposed secretions present.

Born's six cases recovered without serious complication; they were, two cases of placenta prævia; two cases of primiparæ with lacerated cervix and uterine atony; and two cases of uterine atony in multiparæ. In all cases the tampon was a last resort, and its effect was strikingly prompt and efficient and without injurious sequelæ. Born believes that it acts by irritating the internal surface of the uterus, exciting reflex contractions; it also encloses and brings away in its meshes any fragments of placenta or membranes which may be retained.

ECKERLEIN (*Centralblatt für Gynäkologie*, No. 26, 1889) reports four cases of puerperal hemorrhage in which gauze tampons were a last and successful resort. The first was a forceps delivery in a primipara, in whom sudden and dangerous hemorrhage followed delivery. Hot intra-uterine douches, massage, and ergot failing, and the obstetrician having no speculum or dressing forceps at hand, the uterus and vagina were tamponed with iodoform gauze, dipped in carbolic solution (three per cent.), inserted by the finger. The hemorrhage ceased at once; prompt recovery followed. The tampons were removed twenty-four hours after insertion, and were without evidences of decomposition.

The second case was that of a multipara, who had severe hemorrhage fourteen days after labor, and following exertion. The first hemorrhage was checked by hot intra-uterine douches, ergot, and massage; twelve hours after an alarming and sudden hemorrhage brought the patient into collapse. The uterus was emptied of clots and curetted without result; the uterus was then drawn down by tenaculum forceps, and a strip of iodoform gauze three feet long and four inches wide was packed into the uterus; the vagina was also tamponed. Prompt recovery without complication followed. The hemorrhage was probably caused by the dislodgement of a thrombus on exertion; it was interesting to note that the uterus admitted twice as much gauze as immediately after labor, owing to fatty degeneration of the uterine muscle accompanying involution and dilatation on pressure.

In the third case hemorrhage followed version and delivery of a putrid foetus in a multipara. Iodoform gauze wrung out of five per cent. carbolic acid was used as a tampon with immediate success; the patient recovered promptly.

The fourth case was a breech presentation in a multipara in whom uterine atony and dangerous hemorrhage followed delivery. Not having iodoform gauze the attendant saturated darning cotton in five per cent. carbolic acid and tamponed the uterus with it. The hemorrhage ceased and prompt recovery followed.

TWO CASES OF TRIPLETS.

SPERLING (*Archiv für Gynäkologie*, Band 34, Heft 3) reports two cases of triplets. The first had one placenta with one chorion and two amnions; the sex of the children was the same; occlusion of the bowel between the ileum and jejunum existed. In the second case there were three placentæ, with three chorions and three amnions; the sex was unlike; the three ova had come from one follicle or from three rupturing simultaneously.

SPONTANEOUS RUPTURE OF THE UTERUS DURING PREGNANCY.

MADUROWICZ (*Wiener klinische Wochenschrift*, No. 20, 1889) reports the case of a multipara admitted to the hospital with a discharge of pus through the umbilicus and through the vagina; the fœtus had perished six weeks before. Laparotomy revealed a dead fœtus in a cavity filled with pus and fragments of necrosed tissue. The fœtus was removed and drainage established, but the patient died exhausted.

On examination fatty degeneration of the uterine wall at the junction of the fundus and cervix was found. The fœtus had lain in the peritoneal cavity partly encapsulated. It is probable that the fœtus developed in excess of the uterus, which ruptured in the eighth month; the fœtus was expelled into the peritoneal cavity, perished and became encapsulated; purulent peritonitis with intra-peritoneal abscesses followed; membranes and placenta had necrosed. No cause for uterine rupture was discovered.

CANCER OF THE UTERUS; PREGNANCY; RUPTURE OF THE UTERUS.

AUVARD (*Bulletin de la Société Obstétricale de Paris*, No. 5, 1889) reports the case of a patient pregnant the eleventh time, in whom uterine cancer had existed for two years; she was pregnant at term. Labor was exceedingly slow, the pains very weak, but persistent. When partial dilatation was present the os was incised in several directions and the fœtus was found in breech presentation. Labor pains ceasing, extraction by the feet was performed; the fœtus was at term and completely macerated. Persistent hemorrhage followed, and on examination the uterus was found to be ruptured transversely at the upper edge of the lower uterine segment; the patient succumbed.

The cancer was an epithelioma which had invaded the body of the uterus extensively, with papillary hypertrophy. Pregnancy had occurred when cancerous infiltration was well marked, and the growth of the cancer had been greatly stimulated by the pregnant state.

A SUCCESSFUL LABOR FOUR YEARS AFTER RECOVERY FROM RUPTURE OF THE UTERUS.

DEUTSCH (*Centralblatt für Gynäkologie*, No. 14, 1889) reports a case of symmetrically contracted pelvis, in which rupture of the uterus had been successfully treated by laparotomy four years previous. The patient was again pregnant at term.

Examination revealed the uterus adherent to the abdominal wall, the abdomen projecting markedly; the fœtus was living. The uterus was supported by a broad bandage, and morphia given to relieve pain. The os dilated but partially, and a living child was delivered by podalic version. Dangerous hemorrhage followed the delivery of the placenta, which was adherent to the scar in the uterus resulting from the former rupture. The genital tract was tamponned with iodoform gauze, a sand-bag placed upon the abdomen, and the patient's extremities were bandaged. Ergot was subsequently given in small doses repeatedly. Recovery ensued; an exudate in the abdominal wall complicating it. The adhesion of the uterus to the abdominal wall had

caused dislocation of the uterus forward, imperfect development of the uterine muscle, partial dilatation and inertia at labor.

THE PRESENT LIMITS OF CRANIOTOMY.

PHILLIPS (*British Medical Journal*, June 1, 1889) reports 16 craniotomies, 6 upon dead, 10 upon living children; the maternal mortality was *nil*. The smallest true conjugate for which the operation was performed measured two and three-quarters inches; in several cases the brim of the pelvis was normal, but the outlet was contracted. Phillips would advise Cæsarean section when the antero-posterior diameter of the brim is two and one-quarter inches and the mother consents to the operation.

COMBINED CEPHALIC EMBRYOTOMY.

AUVARD (*Archives de Tocologie*, June, 1889) has devised an instrument combining a cranioclast and cephalotribe. It consists of a perforator and a second blade grasping the head externally and fitting upon the first as the blade of a cranioclast fits. A third blade grasps the head externally opposite the second. The external blades are made to crush the head by the screw usually attached to the cephalotribe; when this is completed the blades are kept together by a clamp fitting upon the three.

A PORRO OPERATION FOR FIBROMYOMA COMPLICATING PREGNANCY.

OTT (*Centralblatt für Gynäkologie*, No. 18, 1889) reports a case of pregnancy complicated by fibromyoma of the uterus and bronchitis. Amputation of the uterus was performed, the stump was stitched and dropped into the abdomen. A small abscess formed at the lower angle of the abdominal wound, and a drainage tube was passed through its track and through the vagina. The patient and her child made a good recovery. Six months after a fibroma in the pelvis was found greatly lessened in size.

A SIMPLE SUTURE FOR CÆSAREAN SECTION.

FRITSCH (*Centralblatt für Gynäkologie*, No. 23, 1889) reports two successful Cæsarean sections, in which a suture simpler than Säger's was employed. The suture material was silk. The needle was introduced one-half inch from the edge of the uterine incision, and passed directly through the uterus, including the decidua, emerging a little nearer the incision than the point of entrance; the sutures were not tied until all had been inserted. Before incising the uterus the elastic ligature was placed about the cervix. Fritsch considers the suture of serous surfaces unnecessary.

EXTRA-UTERINE (ABDOMINAL) PREGNANCY.

HOCHSTETTER (*Wiener klinische Wochenschrift*, No. 19, 1889) reports the case of a multipara, suffering from fever, foul diarrhœa, and abdominal tumor; the symptoms of pregnancy had been present, but fœtal movements had ceased. On examination the uterus was empty, slightly enlarged; on its

left was an ill-defined tumor. The stools were fluid, coffee grounds, very foul, containing pus, epithelia, hairs, bacteria, and triple phosphate. Abdominal pregnancy communicating with the intestines was diagnosticated.

Laparotomy was made and a dead foetus removed from a large cavity containing fluid, and a decomposing placenta and membranes. No communication with the abdominal cavity was discovered. Drainage was made by a tube through the vagina; the cavity was emptied and tamponed with iodoform gauze, its walls having first been disinfected by chloride of zinc (five per cent.). Recovery followed.

EXTRA-UTERINE PREGNANCY SIMULATING OVARIAN CYST.

ARTEMIEFF (*Russian Journal of Gynecology*, January, 1889) reports the case of a primigravida who had a temporary suspension of menstruation with gradual increase in the size of the abdomen; as menstruation became re-established and she felt no foetal movements pregnancy was doubted. Physical examination gave only signs of a cyst. Laparotomy revealed tubal pregnancy. The sac was emptied and stitched to the abdominal wall, and a drainage tube was inserted; recovery ensued.

A CLINICAL STUDY IN THE PREVENTION OF PUERPERAL FEVER.

LEOPOLD (*Archiv für Gynäkologie*, Band 35, Heft 1) reports the results of his clinical observation during the year 1888, regarding the cause and prevention of puerperal fever. In 1369 patients, 15 died; 5 from septic infection contracted outside the clinic; 6 from unavoidable non-septic causes; and 4 were infected in the clinic.

Infection occurred in the last cases from vaginal examinations made by an assistant who had just delivered a patient with placenta prævia admitted in a septic condition; by vaginal examinations of women just before labor made by other patients in a nurse's absence; and during a suspension of the use of bichloride of mercury and the use of potassium soap alone for cleansing hands. Ninety-five per cent. of patients were discharged recovered on the twelfth day; 79 per cent. had no rise of temperature.

Especially interesting is a series of 427 patients who were not examined internally, and who received no vaginal douche, of whom 98.4 per cent. recovered without rise of temperature. Leopold finds reason to doubt the theory of auto-infection, and to practise rigid external antisepsis, without interference unless demanded.

ALBUMINURIA DURING PREGNANCY AND PARTURITION.

MEYER (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band 16, Heft 2), in an elaborate study of this subject, in the Copenhagen Maternity, found albuminuria present in 5.4 per cent. of pregnant women; albumin with casts in 2 per cent. Albuminuria with casts was more frequently found in the first than in subsequent pregnancies, from the twentieth to twenty-fourth, and thirty-eighth to thirty-ninth weeks; the age of the patient was without influence. During the last thirty days of pregnancy but 28.9 per cent. of urine examined was without albumin.

Premature births occurred in 8 per cent. more patients who had albuminuria than in those without, and in 21.5 per cent. when casts were present; the greater number of children in the latter patients were born more than four weeks before term. In the majority of cases albuminuria, with and without casts, beginning during pregnancy, persisted during labor.

Of women in labor, 25 per cent. had albuminuria, and 12 per cent. albumin and casts; this condition arose during labor, was most frequent in primiparæ, and was uninfluenced by the patient's age; 53.7 per cent. of patients with albuminuria had casts. Albuminuria during pregnancy persisted after labor, while that occurring during labor generally disappeared subsequently. In patients who had albumin but no casts, a tendency to vesical catarrh after catheterization was noticed.

While in the majority of cases albumin and casts disappeared after labor, in a considerable proportion of cases nephritis supervened, especially in those in whom the condition began during pregnancy; neither the patient's age nor repeated pregnancy influenced these cases. Infarction of the placenta, premature separation, and foetal death were most frequent in cases of albuminuria with casts.

LIGATURE OF A FŒTAL LIMB BY THE UMBILICAL CORD.

MERKEL (*Centralblatt für Gynäkologie*, No. 17, 1889) reports the case of a male foetus on whose left forearm there was a deep circular fissure, the integument rising in ridges on each side; below the ring the limb was œdematous. The cord had a marginal insertion; it was twenty inches long. At birth the cord was not coiled about the foetus, but must have been shortly before; the œdema disappeared after birth.

A CASE OF HEMORRHAGE FROM THE UMBILICAL CORD.

AUVARD (*Archives de Tocologie*, June, 1889) reports the case of a healthy, well-formed infant who had persistent hemorrhage from the umbilical cord after the usual ligation. Ligation of each vessel of the cord separately and a second ligation of all together stopped the hemorrhage; the child lost three and a half ounces of blood, but recovered well.

GYNÉCOLOGY.

UNDER THE CHARGE OF

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OF NEW YORK.

PHYSICAL AND PSYCHICAL CHANGES IN WOMEN, FOLLOWING THE REMOVAL OF THE UTERUS AND OVARIES.

GLÆVECKE contributes an elaborate paper on this subject to the *Archiv für Gynäkologie*, Bd. xxxv., Heft 1. He considers the subject under two heads, the first including the effects of removal of the ovaries; the second,

the changes brought about in the organism by extirpation of the uterus. His deductions are as follows: After removal of the ovaries, menstruation ceases permanently in eighty-eight per cent. of the cases, either at once, or after a certain interval, while in the other twelve per cent. the flow becomes scanty and irregular. Vicarious hemorrhages are rare. In one-half of the cases observed the menstrual molimen persisted after the cessation of the flow. The usual climacteric phenomena, flushing, vertigo, irregular sweating, leucorrhœa, etc., are common, as well as the atrophy of the genital organs which follows the establishment of the menopause. Even when the uterus is considerably enlarged, by reason of the presence of chronic endometritis or fibroids, it commonly returns to its normal size after oöphorectomy, or even becomes atrophied. The general condition usually improves after castration; in forty-two per cent. of his cases the patient became stouter. Sexual desire was diminished in the majority of the cases; in some instances it was extinguished. The psychical disturbances were most marked, sometimes amounting to melancholia. In short, says the writer, removal of the ovaries induces an artificial menopause which is exactly similar to the natural one.

Total extirpation of the uterus in his experience of course led to complete cessation of the menstrual flow (even the vicarious loss), although the molimen was frequently present during the months immediately following the operation—a phenomenon explained by the periodical pelvic congestion due to persistence of the ovarian function. When the ovaries were not removed with the uterus, they suffered little appreciable change in size, although they tended to become atrophied on account of their lessened blood-supply. In every instance ovulation continued until the menopause. The effect of the operation on the body in general was not so marked as removal of the ovaries. The sexual feelings rarely suffered change, and in upwards of one-half of the cases there were no psychical disturbances. In one-third of the cases depression was noted, which under favorable circumstances might terminate in melancholia. In conclusion, the inference was unavoidable that removal of the ovaries produced a far more profound impression upon the entire organism than did extirpation of the uterus alone.

[It is only fair to call attention to the fact that although the writer's cases have been studied in the most careful and exhaustive manner, some of his deductions are so much at variance with those of observers of much wider experience (notably Tait) that we are inclined to receive them with some hesitation. Still, reliable observations of fifty cases are of more value than hasty and incomplete inferences based upon five hundred.—ED.]

GONORRHOËAL SALPINGITIS.

SCHMITT (*Archiv für Gynäkologie*, Bd. xxxv., Heft 1) makes a further contribution to this important subject, based upon observations made in twenty-seven cases of pyosalpinx. He believes that perimetritis may result from gonorrhœa in two ways, viz.: The specific poison may be transmitted directly along the tubal lining membrane, while at the same time the wall of the tube may serve as a channel through which the serous covering is affected, though the inflammation is not specific, since it is improbable that the gonococci could penetrate the wall. Or the gonorrhœal pus may escape into the peri-

toneal cavity and thus light up a perimetritis, which, however, we have no reason to regard as specific in character. The presence of gonococci in the escaped pus cannot be regarded as an argument in favor of the existence of a specific perimetritis, since the acrid character of the pus constitutes its real virulence.

FIBROMATA OF THE OVARIES IN AN OLD WOMAN.

TERRIER (*Progrès Méd.*, 1888, No. 24) reports the case of a woman, seventy-seven years of age, upon whom he performed a double ovariectomy, removing true fibrous tumors. Excessive œdema and ascites were present, but were completely cured after the recovery of the patient, who, at the time of the operation, was in very poor condition.

VAGINAL DRAINAGE OF BROAD LIGAMENT CYSTS.

JASTREBOW (*Zeitschrift für Geburtshülfe und Frauenkrankheiten*, 1888, No. 7) operated successfully in this way upon a woman, fifty-eight years old, to whom he did not venture to administer an anæsthetic on account of marked cardiac and pulmonary disease. The posterior fornix was opened, the cyst punctured, drawn down with forceps, and stitched into the wound. The sac was packed with gauze and soon closed. The reporter suggests this method as preferable to opening the abdomen and stitching the edges of the sac in the wound, especially where it is impossible to empty the cyst completely from above.

[The writer carefully avoids reference to the dangers incurred in opening into the cyst from below. The intimate relations which it must bear to the vessels in the broad ligaments render the procedure somewhat hazardous. It seems more in harmony with the spirit of modern surgery first to open the abdomen, though in a case like the one reported the plan adopted was quite proper.—Ed.]

ILEUS FOLLOWING VAGINAL EXTIRPATION OF THE UTERUS.

V. MÜLLER reported, at a meeting of the Obstetrical Society of St. Petersburg, a case of intestinal obstruction due to adhesion of two coils of small intestine at the bottom of Douglas's pouch. Obstruction did not occur until the tenth day following the operation; four days later fecal vomiting developed and laparotomy was performed on the fifteenth day, but the patient did not survive the shock. The reporter thinks that it is best not to close the peritoneal wound after removal of the uterus, in order to secure free drainage. [In a recent case of vaginal hysterectomy, occurring in the practice of the Editor, intestinal obstruction was recognized on the fourth day following the operation and secondary laparotomy was performed on the fifth. The patient did not recover from the shock of the second operation. There was no peritonitis.]

CASE OF SUPERNUMERARY OVARY.

SIPPEL (*Centralblatt für Gynäkologie*, May 4, 1889) describes an interesting case in which he operated upon a healthy girl, aged twenty-one, for abdominal

tumor. Two dermoid cysts, each with a distinct pedicle, were removed on one side, the pedicle of one cyst having undergone torsion. From the opposite horn of the uterus extended a normal tube, below which was a normal ovary. The writer explains this unique condition by assuming that the cysts developed originally from common germ epithelium, and that a separation occurred early in fetal life.

DEDUCTIONS FROM TWO HUNDRED AND EIGHTY-FIVE LAPAROTOMIES.

TAUFFER, of Budapest (*Orvosi Hetilap*, 1888, No. 48; *Centralblatt für Gynäkologie*), believes, as the result of his experience in these cases, that every movable ovarian tumor as large as the fist should be removed—the earlier the better. Intra-ligamentous cysts should not be disturbed until after they have risen out of the pelvis and are more accessible. Neither extreme youth nor age, chronic visceral lesions, or acute inflammatory processes, should deter one from operating when the life of the patient is at stake. The writer's mortality from ovariectomy (in ten cases there was accompanying supra-vaginal amputation of the uterus) was ten and four-tenths per cent., only four per cent. of the deaths being attributable to sepsis. Of thirty patients, whose ovaries and tubes were removed on various indications, none died. The list includes fifty-one hysteromyomectomies, with twelve deaths, the stump being treated extraperitoneally in every instance.

PELVIC MASSAGE.

WEISSENBERG (*Centralblatt für Gynäkologie*, June 1, 1889) states that he learned the principles of pelvic massage from Spiegelberg twelve years ago; it was then practised as an adjunct to the bath cure, which the writer still believes to be its true province. With regard to the technique of massage, he agrees with Thure Brandt that it is necessary for the operator to have a long and powerful index-finger in order that he may be able to reach and to stretch properly adhesions high up in the pelvis. To supply this deficiency in the physician the writer has devised a wooden obturator, like Bozeman's vaginal dilator, which is inserted into the posterior fornix and opposes the fingers placed upon the abdomen. If the pelvic adhesions or indurations are very tender the end of the obturator may be covered with soft rubber.

COVERING INOPERABLE CANCEROUS ULCERS WITH FLAPS OF HEALTHY SKIN.

KRASKE (*Münchener med. Wochenschrift*, 1889, No. 1) calls attention to the fact that if a cancerous ulcer (*cancer apertus*) can be healed or transformed into a *cancer occultus*, even though no attempt is made to remove it, many of the distressing accompaniments of the disease will be removed. To accomplish this, he removes the prominent masses and ulcerated portions as much as possible, then forms two flaps from the adjacent healthy skin and unites them over the wound. If the operation is performed under strict antiseptic precautions primary union is the rule.

[This plan might be adopted with advantage in cases of cancer of the vagina

and external genitals, where the redundancy of the tissues favors the formation of large flaps.—ED.]

THE RECOGNITION OF VULVO-VAGINITIS IN CHILDHOOD.

F. SPAETH (*Münchener med. Wochenschrift*, May 28, 1889) examining the discharge in twenty-one cases of vulvo-vaginitis, occurring in girls between the ages of three and eleven, found Neisser's coccus in fourteen. In none of the other seven patients did the inflammatory process extend to the urethral mucous membrane—an extremely important diagnostic point. In adult females with gonorrhœa the urethral discharge always contains the most characteristic gonococci. A specimen of this discharge is obtained for examination in children by first thoroughly irrigating the vagina with a sublimate solution, a small glass catheter being used for the purpose; as the catheter is withdrawn, its inner end is pressed along the urethra until, as it emerges, a drop of pus is squeezed from the meatus.

It is not always easy to discover the source of the infection. In eleven cases the mother had gonorrhœa, in two the father; in three only had the child been violated. Epidemics in families and hospitals are usually traceable to infected clothing, sponges, thermometers, etc.

The writer raises an interesting question, viz.: whether in children there is danger of the specific inflammation extending from the vagina to the uterus and tubes. In general, the trouble is limited to the lower portion of the genital tract, although a few cases of pyosalpinx of gonorrhœal origin have been reported.

The treatment of vulvo-vaginitis in children varies. Vaginal injections of carbolic acid, sublimate, and boro-salicylic solutions, pencils of thallin and iodoform, and soothing ointments are useful. The vagina is syringed out two or three times a week with a solution of bichloride (1 : 2000), after which a small iodoform pencil, containing a little sulphocarbolate of zinc, is introduced into both the vagina and urethra, the pencils being kept in position by a small tampon.

The progress of these cases is slow, the average duration of treatment being three and one-half months. It is highly important that local treatment should be directed to the urethra, since the folds of its lining membrane afford lodgement for the specific virus after the vulvo-vaginal mucosa is apparently healthy.

In concluding, the writer states his belief that in all cases of vulvo-vaginitis in children in which the urethra is affected and Neisser's coccus is found in the discharge, there has been specific infection even when the inflammation develops in the course of one of the acute exanthemata.

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ON THE HEALING OF ASEPTIC BONE CAVITIES BY IMPLANTATION OF ANTISEPTIC DECALCIFIED BONE.

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THE antiseptic treatment of wounds as now almost universally practised constitutes the greatest triumph of modern surgery. Since this treatment has become developed to its present state of perfection primary union is no longer the exception, but the rule. The failure to obtain healing by first intention of an intentional wound made by the knife of the surgeon through aseptic tissues, or of a recent accidental wound, in which parts of the same anatomical structure can be approximated and coaptation uninterruptedly maintained, must be looked upon as an evidence of a faulty technique or want of proper care on the part of the surgeon or his assistants in carrying out the principles of antiseptic surgery. Primary union in the sense in which this expression should be now used means the restoration of injured or lost parts without suppuration. It is a purely reparative process in which all the newly formed tissues are utilized in permanently cementing together divided parts or in restoring tissues lost by injury or disease. If a definitive union or repair is accomplished without suppuration, it must be called primary union whether this result has been obtained with or without visible granulation tissue.

An ideal primary union is one where the surface and deep parts can be brought together and held in perfect approximation until in a few days, by interposition of new living tissue between the divided structures,

the interrupted anatomical continuities have become permanently restored and the suspended physiological functions established. Practically such a result is not often obtainable. Even the most improved methods of approximation and coaptation frequently fail in securing such accurate apposition of similar tissues as to enable organic union to take place in such a short space of time and accomplished by such a small amount of reparative material. Under most circumstances spaces are left here and there between the surfaces of the wound which are first occupied by blood or serum and later by granulation tissue, which in the course of time is transformed into cicatricial tissue and by its contraction unites or brings in closer contact the divided tissues.

The time required for the definitive healing of a wound, other things being equal, will therefore depend largely upon the accuracy with which coaptation can be effected and maintained. In wounds with considerable loss of tissue, and in the healing of cavities with rigid, unyielding walls where coaptation of surfaces which it is the intention to unite, for physical reasons is rendered impossible, we have to rely upon the process of granulation in effecting repair and in restoring interrupted continuities. Under the old treatment the healing of wounds by secondary intention was often prolonged for an indefinite period of time because under the influence of pus microbes or their ptomaines the embryonal cells of which the granulation tissue is composed were transformed into pus corpuscles, and thus the reparative process was delayed until the infective process had exhausted itself, as it were, or until the granulation tissue was in a condition to resist successfully the deleterious effect of pus microbes or their products.

The most signal success of the antiseptic treatment has been obtained in the repair of parts where healing has to be accomplished by the formation of an extensive mass of granulation tissue. If an aseptic condition is maintained throughout, all of the granulations are transformed into tissue of a higher type and extensive defects are healed in a few weeks under a single dressing. Primary healing of an empty large cavity with unyielding walls, even without suppuration, requires often weeks and months, and not infrequently is but incompletely accomplished, as the granulations find no temporary support, and from the absence of such support the process comes to a standstill, while epidermization takes place on its surface *pari passu* with the disappearance of the temporary bloodvessels in the deeper parts which are undergoing cicatrization. When the healing process is finally completed it is at the expense of a considerable loss of substance. Such difficulties are almost invariably met with in the treatment of bone cavities.

I purpose to describe a new method of treatment which I have found exceedingly useful in overcoming the obstacles to favorable and rapid healing by granulation in such cases. Before giving a description of

this method I will call attention to a number of attempts made in the same direction during the past.

A few years ago Dr. Neuber, then assistant to Professor von Eschmarch, of Kiel, introduced a method which was intended to secure a speedy definitive healing of the wound without aiming at reproduction of the tissues destroyed by the disease or removed by the operation. It consisted in fully exposing a tuberculous depot in bone or an osteomyelitic deposit, after thorough removal of the products of inflammation with spoon, gouge, or chisel, and chiselling away the margins of the cavity sufficiently to permit the soft parts to be turned inward, thus covering the entire surface of the denuded bone. The cavity was thoroughly disinfected before the flaps were implanted. The flaps were fastened with bone nails. In case the cavity was limited, and, as is so often the case near a joint, the skin flap was made in such a manner that the base was directed toward the joint. In diffuse osteomyelitis of the long bones a gutter was chiselled out and the flaps on each side turned inward in such a manner that their margins came in contact in the bottom of the gutter. Two great objections can be raised against this method:

1. It requires the removal of an unnecessary amount of healthy bone in order to enable implantation of the skin flaps.

2. As the result of tension from fixation of flaps, pressure on the part of the dressings, and more particularly on account of a serious diminution of the vascular supply of tissues predisposed by antecedent disease, gangrene of the flaps has frequently occurred.

I gave this method a fair trial in a number of cases, but I never obtained an ideal result—that is, primary union between flaps and between flaps and the subjacent bone. In a number of cases gangrene of some portion of the margins of the flaps occurred, leaving defects which required a long time to become repaired by a slow process of granulation, cicatrization, and epidermization. This method has a legitimate sphere of usefulness and application in cases of superficial osteomyelitis followed by necrosis, but should never be employed if the disease is centrally located, requiring in its operative treatment the formation of a deep gutter. The next idea that presented itself was to utilize a blood-clot for the purpose of expediting the definitive healing of bone cavities. Years ago Lister observed that under the antiseptic dressings in aseptic wounds coagula between the surfaces of the wound did not undergo putrefactive or degenerative changes, but as he believed, and asserted, became supplied with bloodvessels and were organized. A few weeks after the operation or accident which inflicted the wound he saw that the blood-clot had undergone vascularization and presented other evidences of organization.

In 1876 Lesser visited Lister's wards and made a special study of the organization of blood-clots in aseptic wounds, and reported the results of

his observations in the *Deutsche Zeitschrift f. Chirurgie*, vol. iii. Neuber, as early as 1879, after operations for necrosis, allowed the cavity to fill with blood with the expectation that the same favorable conditions could be secured for the blood-clot by thorough antiseptis as in recent wounds, but the results in these cases were so unsatisfactory that he soon abandoned the idea.

In the admirable paper of Professor von Volkmann, read at the London meeting of the International Medical Congress, special attention was called to the part taken in the healing process of the blood-clot between the fragments in compound fractures. At the end of six weeks he found at the site previously occupied by the coagulum living vascular tissue. Watson Cheyne gives a full description of the organization of blood-clots in recent wounds in his work on *Antiseptic Surgery*.

T. B. Hamilton (*Journal of Anatomy and Physiology*, vol. xiii., 1879; *Edinburgh Medical Journal*, November, 1881, p. 385) substituted for the blood-clot aseptic sponge, as he found that this substance was promptly removed by absorption in aseptic granulating wounds. Sponge-grafting was for a time quite extensively resorted to in hastening the process of repair of hollow wounds in soft parts, but, to my knowledge, was seldom practised after operations on bone.

In a paper read at the meeting of the German Congress of Surgeons in 1886 ("Ueber Heilung von Wunden unter dem feuchten Blutschorf") Schede described what he deemed a new method of treating wounds where accurate coaptation of the parts could not be secured. Schede's method consists in a careful conservation of the blood-coagulum combined with the completion of the healing process under a moist blood-crust. For instance, in operating on a long bone for necrosis, osteomyelitis, or any other lesion centrally located requiring in the removal of the pathological product the formation of a cavity, he renders the part bloodless by applying an Esmarch's constrictor on the proximal side, and, after having removed the dead bone or diseased tissue, he disinfects the cavity thoroughly and then sutures the soft parts in such a manner that a space is left open at a point corresponding to the summit of the cavity. This insures complete filling of the cavity with blood after the removal of Esmarch's bandage. No drainage-tube is introduced. The wound is covered with a strip of protective silk, over which is applied a copious absorbent antiseptic compress. The bandage for retaining this dressing is not firmly applied, in order that a sufficient amount of bleeding may take place to fill the cavity. The protective silk prevents the drying up of the exposed portion of the clot and secures at the surface of the wound the formation of the moist blood-crust, upon the presence of which so much stress is laid by the author for the subsequent favorable and rapid healing in the depth of the wound.

Schede's experience with this method of treatment has been exceedingly favorable. Small cavities in bone he has healed completely in from twelve to fourteen days, while large cavities required from three to six weeks. In some instances this treatment proved a failure even in his hands, and in these cases the unfavorable result could sometimes be traced to an inadequate hemorrhage, the cavity filling only partly with blood. When imperfect filling of the cavity with blood was found the cause of failure of the entire cavity closing under one dressing, the healing was found to have proceeded only as far as the coagulum reached, and the balance of the cavity closed later by the usual tedious process of granulation from the wound surfaces and the upper surface of the granulation mass. In operations for tuberculous affections of bone he found not infrequently a recurrence of the disease in the cicatrix of the wound which had healed by primary union. In severe cases of general tuberculosis the so-called organization of the coagulum did not take place. The author insists that only clean and aseptic wounds are adapted to this form of treatment. In cases where it is impossible to secure asepticity of the bone cavity, or where the primary treatment failed, he waits until suppuration has ceased, and then, by scratching the granulation surfaces, obtains enough blood to fill the cavity and then applies the same dressing as in recent cases. A number of cases are reported to show that this plan has proved successful.

In the discussion which followed the reading of this paper, von Bergmann reiterated his views that he had so strongly expressed on a previous occasion, that in the treatment of all wounds it should be the surgeon's imperative duty to effect complete hæmostasis, as the accumulation of blood in wounds renders antiseptic treatment more difficult and less efficient. Volkmann stated that he did not believe in the transmutation of blood as a tissue, as extravasated blood is removed by absorption and gradual substitution on the part of the granulations. He favors moderate compression of the wound, so as to prevent unnecessary loss of blood, as the escape of blood beyond what is necessary to fill the minute spaces between the wound surfaces is unnecessary and injurious.

At the meeting of the German Congress of Surgeons last year, Lauenstein ("Zur Heilung der Wunden unter dem feuchten Blutschorf") read a paper on Schede's treatment of wounds, wherein he compared the healing under a moist blood-crust to the healing under a dry crust as described by John Hunter. He regards the superficial portion of the coagulum in the light of an occlusive dressing. During two years he resorted to this treatment in seventy-four cases, with the result that in sixty-four it proved successful, and proved a failure only in ten. A cavity in the head of the tibia the size of a walnut, caused by the removal of a tuberculous deposit, he found completely healed under one dressing after three weeks. In four operations for extensive necrosis

the treatment failed. In one case coagulation of the blood in the cavity failed to take place, a circumstance which he attributed to imperfect antiseptis, and yet the final result was favorable.

Schleich has studied this subject experimentally, and, as the result of his observations, he claims that the aseptic coagulum must be considered as a porous organic substance which, by compression, occlusion, and by diminishing wound secretion, places the cavity in which it is located in a more favorable condition for healing.

Landerer asserts that extravasated blood takes no active part in the healing of a wound, and he attributes Schede's success more to faultless antiseptic measures than the presence of the coagulated blood. In the light of modern research, it must be conceded that, when blood escapes from vessels into the tissues or accumulates between the surfaces of a wound, it has lost its physiological functions and has become a foreign substance. If the blood and its surroundings remain in an aseptic condition, it is removed sooner or later by absorption on the part of the granulations which take its place by substitution. The blood-coagulum in Schede's treatment of wounds serves as a temporary nidus for the granulations which permeate it from all directions, thus placing the cavity in a condition capable of becoming filled with a mass of active granulation tissue and a reticulum of bloodvessels, which furnish ample nutrition for the growth and development of the new tissue while the blood is removed by the encroaching granulations. A hollow, empty space, particularly in a bone, where its walls are firm and immovable, presents the most unfavorable conditions for healing by the process of granulation. As the granulations and vessels have no support toward the centre of the cavity, the defect is repaired in a slow and unsatisfactory manner. The deeper portions of the granulation tissue undergo transformation into tissue of a higher type, and, while this change is undergoing perfection, the vascular supply toward the surface is diminished by disappearance of many of the new temporary vessels, and the conditions for the growth and development of the granulations are correspondingly impaired. A coagulum, as long as it remains aseptic and sufficiently firm, furnishes an admirable support for the granulations and delicate new bloodvessels, and constitutes the direct means by which the entire cavity is filled with active and exceedingly vascular granulation tissue in a remarkably short time. Schede's treatment marks a decided advancement in the treatment of bone cavities, but is open to the following objections:

1. It implies an unnecessary loss of blood, which, in some cases at least, must be detrimental to the patient. The loss of from two to eight ounces of blood required to fill a bone cavity in an anæmic child or a marantic adult might result in a collapse which a careful hæmostasis would have prevented.

2. The blood-coagulum is at best but an aseptic substance. Careful hæmostasis is one of the essential requirements of good surgery. Perfect asepsis is not always attainable. Recent experiments have demonstrated the fact that pathogenic microbes are more likely to become the cause of disease when they come in contact with substances that serve the purpose of a culture soil. Coagulated and fluid blood, at the temperature of the body, furnish an admirable culture substance for a number of the most dangerous varieties of pathogenic microbes. In case perfect asepsis is not obtained, the coagulum of necessity must become a source of danger.

3. The bleeding may not be sufficient in quantity to fill the entire cavity. In such cases the prompt and early production of embryonal tissue will be limited to the size of the coagulum, and the balance of the cavity has to close by the ordinary slow process of granulation and cicatrization.

4. The extravasated blood may fail to undergo coagulation, and fluid blood would not form a good medium for the rapid diffusion of the granulations throughout the entire cavity.

It occurred to me that if in the healing of bone cavities an absorbable, firm, antiseptic substance could be substituted for the coagulum, it would present a number of advantages not obtainable by Schede's method. The substance which I selected for my experimental and practical work was thoroughly decalcified bone, rendered not only completely aseptic, but *thoroughly antiseptic* by keeping it immersed for a considerable length of time in sublimate alcohol (1 : 500). Before the removal of Esmarch's bandage, and after thorough disinfection of the cavity, its walls and the bone chips are lightly dusted with iodoform before implantation is made. The wound is completely closed, with the exception of the lower angle, where a capillary drain of a few threads of catgut is introduced. I shall first describe the details and the results of my experimental work. All of the experiments were made under strict antiseptic precautions. The part to be operated on was shaved, thoroughly washed with warm water and potash soap, and disinfected with a 1 : 2000 solution of sublimate. The same solution was used for irrigation during the operation. The bone was exposed by a straight incision, and after reflecting the soft parts the bone defect was made either with a trephine or chisel, the former instrument being used mostly in the operations on the skull and the latter in excavating the long bones. The operations on the extremities were rendered bloodless by using elastic constriction. In all instances the cavity was filled by a piece of well-decalcified antiseptic bone, which was so cut as to fit the cavity as accurately as possible. In some cases the bone plate, after implanting it in a trephine opening, was fastened in its place by driving two or more small aseptic steel nails into the margins of the opening. Before

implantation the cavity and the bone plate were dusted with iodoform. The external wound was completely closed, without making any provision for drainage. Where the fact is mentioned the plates were perforated with numerous small openings, so as to enable the granulations to penetrate it more readily and thus expedite the process of absorption and substitution.

I. IMPLANTATIONS OF DECALCIFIED BONE-DISKS AFTER TREPHINING OF THE SKULL.

Exp. 1.—Dog, weight fifteen and a half pounds. Operation Nov. 13, 1887. A disk of bone was removed from each side of the longitudinal sinus with a trephine three-quarters of an inch in diameter at a point corresponding to the junction of the anterior with the middle portion of the cranial vault. From the right opening a profuse hemorrhage occurred, which had to be arrested by plugging it firmly with iodoform gauze, which was left in the wound. A circular piece of decalcified bone, corresponding in size to the trephine opening, rendered strongly antiseptic by several days' submersion in a 1 : 500 solution of sublimate in alcohol and by sprinkling it with iodoform, was implanted. The thickness of the disk corresponded to the diameter of the cranial bones at the site of operation. The piece of bone was driven into the opening with a hammer, so as to secure fixation by pressure. The antiseptic dressing was retained by plaster-of-Paris bandage, which was made to encircle the entire head. Primary healing of wound. No untoward symptoms. Dog killed forty-four days after operation. Brain adherent to dura on left side. Left trephine opening closed by a firm cicatricial mass, corresponding in thickness to the cranial bones. External margins of this opening little, if any, bevelled. Cicatrix not translucent. The opening in the skull considerably diminished in size by new bone deposited upon its margins. Right opening appears somewhat enlarged externally by absorption of margins, giving it a strongly bevelled appearance. The centre of the thin membrane closing the defect in the skull translucent, and at this point slight bulging in outward direction.

Exp. 2.—Old dog, weight fifteen and a half pounds. Operation same as in the first experiment. Right trephine opening plugged with a circular decalcified bone-disk. From the left opening profuse hemorrhage, caused by injury of a large vein contributory to the longitudinal sinus. As the bleeding did not yield to compression, it was finally arrested by irrigation with hot water. Wound healed by primary union. Animal killed at the end of three months. Examination of the skull showed on the right side that the opening in the bone was considerably diminished in size, the balance of the defect being closed by a firm circular membrane seven-sixteenths of an inch in diameter, presenting in the centre and toward the left side a translucent point. Left opening about the same, only that the defect in the bone was somewhat larger, the membrane somewhat thinner, and the surfaces not as smooth as on the opposite side.

Exp. 3.—Young dog, weight seventy and a half pounds. In this case two disks of bone were removed on each side of the middle line, and the two openings transformed into an oblong defect, one and a half by three-quarters of an inch, by the use of a chisel. On the left side free hemorrhage from a small artery in the dura mater, which was arrested by plugging the opening firmly with a plate of decalcified bone corresponding in shape and size to the piece of bone removed. Slight suppuration from the surfaces of the wounds. Killed four weeks after operation. Right opening not diminished in size; closed by a thin translucent membrane; external margins strongly bevelled. Left opening closed by new bone, with the exception of a space one-third of an inch in diameter, which is occupied by a thick, firm membrane.

Exp. 4.—Old dog, weight fifty-nine pounds. On the left side of the median line of the cranial vault a portion of the bone, one and a half

inches in length and three-quarters of an inch in width, was removed with trephine and chisel, and closed with an accurately fitting plate of decalcified bone. Hemorrhage was very profuse from the large veins of the diploë, but was promptly arrested by the bone implantation. Slight suppuration in the superficial portion of the wound. Animal killed seventy-five days after operation. The opening in the skull was found greatly diminished in size by the formation of new bone from the margins. The defect was closed by an oval, thick, and firm membrane one and three-eighths inches in length and three-eighths of an inch in width. Margins of opening in the bone bevelled at the expense of the external table.

Exp. 5.—Old dog, weight forty-four pounds. Three disks of bone were removed with the trephine on the left side and parallel to the sagittal suture. These openings were transformed with the chisel into an oblong space one and one-fifth inches long and three-quarters of an inch wide. The hemorrhage from the bone was very profuse and could only be arrested by the implantation of a closely fitting decalcified plate of bone. The animal was stupid and disinclined to move for four or five days. At the end of the first week the dog appeared as lively as before the operation. The skin at the site of operation was raised, and underneath it a fluctuating swelling could be felt. The sutures were removed, and on opening the posterior angle of the wound about two fluidrachms of a sero-sanguinolent fluid escaped. Two weeks after the operation it was ascertained that the dog had become deaf, otherwise the recovery was complete. The deafness remained at the time the animal was killed, seventy-two days after the operation. The anterior portion of the defect in the skull was closed by a firm membrane, to which the brain was adherent over a surface the size of a split pea. The defect in the bone measured one and one-fifth of an inch in length, posteriorly two-fifths of an inch in width, while anteriorly the bony margins were only distant one-third of an inch. Membrane nearly as thick as the surrounding bone. These appearances indicate that the defect in the skull had been considerably diminished by ossification proceeding from the margins of the opening.

Exp. 6.—Young dog, weight fourteen and one-third pounds. One disk of bone removed with trephine from left side well under the temporal muscle. Opening plugged with a disk of decalcified bone. Primary union of wound. Animal killed seventy-two days after operation. Osseous defect greatly reduced in size, as the circular thick membrane which was present in the centre of the opening measured only seven-sixteenths of an inch in diameter.

Exp. 7.—Old dog, weight fifty pounds. On the left side, some distance from the sagittal suture and parallel with it, three disks of bone were removed with the trephine, and the two anterior openings made into an oblong space with the chisel. In the posterior opening the inner table was left *in situ*, on account of its being directly over the lateral sinus. The hemorrhage, which was quite profuse, was arrested by means of hot-water (120° F.) irrigation. In this instance the decalcified bone-plate was fixed in its place by driving an aseptic steel nail into the margins of the opening at either extremity. Considerable swelling of soft parts at the time the sutures were removed; later, a slight discharge from wound. The animal never showed any signs of cerebral disturbance, and was killed eight weeks after operation. In the centre of the cicatrix the brain was found adherent over a limited surface. Nails not found, and are supposed to have escaped through the wound at the time it was discharging. Posterior third of defect closed by bone which presented a rough appearance externally and was nearly as thick as the surrounding bone. Anterior two-thirds of the opening occupied by a thick membrane, five-eighths of an inch in length, which was traversed by spurs of bone from opposite sides, so that at some points the new bone seems to bridge the defect completely. This specimen presents a beautiful illustration of advanced substitution of the decalcified bone-plate by osteoplastic material from the margins of the opening.

Exp. 8.—Young dog, weight fifteen pounds. In this instance the trephine was applied too near the frontal sinus, and on removing the disk of bone

it was found that this structure had been opened. The opening in the sinus was plugged with a piece of iodoform sponge, and another disk of bone was removed immediately behind the first opening, and the intervening projections of bone removed with the chisel. The plate of decalcified bone was fastened with two small steel nails. Some suppuration from the anterior angle of the incision followed, and the nails undoubtedly escaped through this opening. As suppuration continued, the bone-plate was removed and the wound was thoroughly disinfected, and a new plate introduced two weeks after the operation. After this the wound healed rapidly. Animal killed one hundred and four days after operation. At the anterior angle of the wound a small opening led directly into the frontal sinus. The oval defect in the bone was occupied by a dense, firm membrane one inch long and half an inch wide, presenting two translucent points near its centre.

Exp. 9.—Old dog, weight thirty-nine and a half pounds. With the chisel a portion of the cranial vault, one and four-fifths inches in length and three-quarters of an inch in width, was removed on the left side of the skull some distance from the sagittal suture. The hemorrhage from the dura mater was profuse, and resisted the ordinary hæmostatic measures, but was finally controlled by an application of the actual canterbury. The plate of decalcified bone which was implanted was perforated by numerous small openings, for the purpose of facilitating the penetration of granulation tissue. The plate was fastened in its place by two steel nails. No unfavorable symptoms. Animal killed thirty-two days after operation. The opening in the skull was found closed by a thick, firm cicatrix, corresponding in thickness to the diameter of the cranial bones. Formation of new bone had diminished the opening to a space one and three-tenths of an inch long and three-eighths of an inch wide. Nails encysted, the one in the anterior margin being firmly and immovably fixed in the bone, while the one in the posterior margin had become somewhat loosened.

Exp. 10.—Dog, weight twenty-two pounds. An area of bone, one and three-quarters of an inch in length and eighty-six one-hundredths of an inch in width, was removed with trephine and chisel on the left side of the skull. A dural vessel which bled profusely was ligated with fine silk. A perforated plate of decalcified bone was implanted. The operation was followed by suppuration and suppurative pachymeningitis, which resulted in a subdural abscess and perforation into the longitudinal sinus, in consequence of which the dog died eight days after operation. The specimen is preserved for the purpose of showing the method of implantation after trephining.

These experiments demonstrate the value of implantation of a disk or plate of decalcified bone after operations on the skull where re-implantation of the bone removed cannot be practised. It is applicable in cases where loss of bone has been sustained by injury or after operations for osteomyelitis, tumors, or syphilitic or tuberculous disease of the cranial bones. Implantation of decalcified bone prevents direct union between the pericranium and the brain or its envelopes. The implanted bone is removed by the granulation tissue which forms all around it, and thus a large mass of embryonal tissue is interposed between the soft tissues covering the skull and the underlying coverings of the brain, a condition which is favorable to the formation of new bone at the site of the operation. In all instances where this procedure was resorted to, the defect in the skull had been more perfectly repaired than on the opposite side, where the soft parts were brought in direct contact with the cranial contents. In cases where the trephine disks or the chips of a chisel operation are aseptic and healthy, Macewen's method of re-implantation

should be done; but where this plan cannot be followed, implantation of decalcified bone constitutes the best substitute.

Aside from favoring the process of osteogenesis, the bone-disk answers a most useful purpose in affording protection to the brain, and in arresting hemorrhage from the vessels of the diploë. It is unsafe to rely upon the hæmostatic effect of the implanted bone when the hemorrhage takes place from the surface of the dura mater, as in such a case there is danger arising from compression of the brain from a blood-clot forming between the disk and the dura mater, but when troublesome hemorrhage is encountered from the vessels of the bone, it is promptly arrested by pressure made by the implanted disk. If the implantation is intended to act as a hæmostatic, then the plate of bone should fit the opening closely, so as to exercise direct compression against the orifice of the bleeding vessel. Bone, when thoroughly decalcified, is an elastic substance, and can be readily compressed at the time of implantation. I am strongly impressed with the advantages to be derived from multiple perforations in the disk, as the perforations, in the first place, afford free drainage to the space between the dura mater and the disk; secondly, they increase the elasticity and compressibility of the disk; and, thirdly, they expedite the removal of the disk by absorption and substitution by the granulation tissue. For the purpose of retaining the disk in place after implantation, one of two expedients may be resorted to:

1. The opening in the bone is shaped, at least at some points, in such a manner that the margins are bevelled at the expense of the internal table.

2. Two or more fine bone nails, rendered thoroughly aseptic, can be driven into the margins of the opening.

The bone-plates should correspond in thickness to the margins of the opening. If implantation of decalcified bone after operations on the skull does not entirely prevent the inconveniences incident to defective repair of the cranial defect, it can be relied upon as a measure which is well calculated to favor the reparative process, and to secure for the cranial defect which remains after the process of ossification has ceased, a firm, thick, and unyielding protective cicatrix, far superior to the cicatrix which forms where no re-implantation of bone or implantation of decalcified bone is resorted to.

II. IMPLANTATION OF ANTISEPTIC DECALCIFIED BONE IN THE TREATMENT OF BONE CAVITIES.

The following experiments were made for the purpose of studying the process of healing in antiseptic bone cavities after implantation of decalcified bone. In making the cavities the compact layer was removed with a chisel, and the spongy tissue and medulla with a sharp spoon. With a view to eliminate the function of the periosteum as an osteo-

genetic agent at the site of the operation, this structure was excised over an area corresponding in extent to the circumference of the cavity. The decalcified bone was cut in pieces to fit the cavity, and the wound in the soft parts was closed completely. In suturing the wound, catgut was used for the deep tissues and silk for the skin. The antiseptic dressing was retained in place with a plaster-of-Paris dressing.

Exp. 11.—Old dog; weight twenty-nine and three-quarters pounds. Operation February 23, 1888. A gutter was chiselled in the left tibia over its anterior upper aspect one and one-seventh inches long, one-fourth of an inch wide, its depth including the entire medullary cavity. The cavity was dusted with iodoform, and a piece of decalcified bone implanted in such a manner that the entire cavity was plugged. Primary union of wound. Dog killed thirty-five days after operation. Skin not adherent to subjacent bone. Site of operation marked by a slight depression on the surface of the bone. Centre of cavity filled with a firm cicatricial mass, into which spurs of bone are seen to project from each side and the floor, leaving a central line about one-thirtieth of an inch in width occupied by tissue which has not yet undergone ossification. Examination of this specimen shows that ossification commenced from the osseous walls of the cavity and progressed toward the centre of the implanted bone, and would have eventually resulted in the production of a sufficient quantity of new bone to fill the entire cavity. The process of ossification in this case was slow, probably on account of the advanced age of the animal.

Exp. 12.—Dog; weight twenty-one pounds. Operation the same as in the preceding experiment. Animal killed fifty-seven days after operation. At site of operation the tibia presents a symmetrical spindle-shaped enlargement corresponding in length to the length of the cavity. Margin of cavity somewhat raised by the formation of new bone. Cavity much diminished in size by the formation of new bone from its surfaces, the centre occupied by connective tissue undergoing ossification. Process of repair further advanced in the upper than the lower portion of the cavity.

Exp. 13.—Young dog; weight twenty-nine and three-quarters pounds. Implantation of a decalcified piece of bone two inches long, and one-third of an inch wide into a cavity made in the upper end of the left tibia, parallel to the axis of the bone. Animal killed eighty-two days after operation. Bone at point of operation considerably enlarged in all directions, imparting to it the appearance of a fracture repaired with little or no displacement. Cavity almost completely filled with new bone, leaving only in the centre a few points which had not so far undergone ossification. Surface of new bone somewhat rough and on same level with the margins of the cavity. This specimen furnishes a beautiful illustration of the existence of plastic periostitis and osteomyelitis starting from the seat of trauma and involving the entire thickness of the bone.

Exp. 14.—Young dog; weight seventeen and one-half pounds. Operation the same, only that by accident the knee-joint was opened. Animal killed seventy-two days after operation. Bone at site of operation not enlarged, only that the margins of the cavity present a ridge of dense bone. The entire cavity filled with compact bone, which on its surface is rough and firmly adherent to the soft tissues. A longitudinal section of the bone through the centre of the cavity shows that the new bone is exceedingly dense, and that partial restoration of the medullary cavity has taken place. The injury of the knee-joint resulted in bony ankylosis between the articular surfaces of the tibia and femur. These experiments demonstrate that it requires a long time to fill with new bone a cavity two inches long and five-sixteenths of an inch wide, the average time being approximately from seventy-five to ninety days. The length of time is greatly modified by the age of the animal, as ossification of the granulation tissue progresses much more rapidly in young than in old animals. Ossification takes place first

in the oldest granulations starting from the bone surfaces and advances toward the centre of the cavity in the shape of spurs or projections, so that in a cavity where ossification has not been completed after removal of the soft tissues, the new bone presents a rough and uneven surface. In the specimen from the last experiment the compact tissue in the medullary cavity has become osteoporotic and medullary tissue has become deposited in spaces over an area indicating the extent of the new medullary canal.

III. CLINICAL OBSERVATIONS ON IMPLANTATION OF ANTISEPTIC DECALCIFIED BONE.

CASE I. Circumscribed central osteomyelitis of head of tibia.—A man, thirty five years of age, German, by profession a teacher, was admitted into the Milwaukee Hospital, October 26, 1887. No history of syphilis. Received a glancing gunshot injury of the tibia during the Turko-Servian war. The bone was not fractured, and the wound healed in the course of a few weeks. Since then he has been in excellent health, and the injured leg caused him no inconvenience until six weeks before his entrance into the hospital. At that time, without any apparent cause, he was attacked with a deep-seated pain at the site of the previous injury. The pain became so excruciating that the patient, finding no relief from the usual treatment, repeatedly threatened to commit suicide. Examination revealed a scar at the junction of the epiphysis with the shaft of the tibia over the anterior surface. No swelling of soft parts and no enlargement of the bone, but a circumscribed spot exceedingly tender to pressure indicated the seat of pain. The diagnosis of circumscribed deep-seated suppurative inflammation was made.

The leg was shaved and thoroughly disinfected and the operation performed without an anæsthetic, as the patient refused to take either ether or chloroform. Esmarch's constrictor was applied to the thigh and the bone exposed by a straight incision. The periosteum at this point was found slightly thickened and abnormally vascular. The tibia was opened with a small round chisel and an abscess cavity the size of a hazelnut disclosed near its centre. The cancellated tissue around the abscess was osteoporotic and infiltrated with pus, which required the removal of more bone with the chisel and sharp spoon, until the cavity in the bone measured one-fourth of an inch in length and one-sixth of an inch in width, when healthy tissue was reached. The cavity was thoroughly irrigated with a strong solution of sublimate, well dried and dusted with iodoform, when it was firmly packed with iodoformized decalcified bone chips. A catgut drain was introduced into the lower angle of the wound, the periosteum sutured with catgut and the skin with silk. A copious antiseptic, absorbent dressing, composed of iodoformized gauze and a cushion of sublimated moss applied and the elastic constrictor removed. The limb was placed upon a posterior splint and was kept in an elevated position. The pain was promptly relieved.

First dressing at the end of a week, when the wound was found completely healed with the exception of a few granulations at the point of drainage. The patient left the hospital four weeks later, when, by an examination of the bone, it would have been difficult to locate the site of operation. The cicatrix was movable and not adherent to the subjacent bone. There has been no return of any symptoms since the operation.

It is hardly probable that in this case the osteomyelitis was caused by pus microbes which might have remained in the tissues since he sustained the injury. As the injury to the bone was superficial and the abscess was centrally located, it is more reasonable to assume that the injury created a *locus minoris resistentiæ*, and that the tissues thus predisposed became infected by floating microbes from the circulating blood. The customary treatment for such a lesion consists in operative measures, which are intended simply to secure an outlet for the products of inflammation, while the successful treatment of the cavity with decalcified bone depends on securing perfect asepticity of the cavity, which in this instance required the removal of a considerable area of infected tissue beyond the limits of the abscess.

CASE II. *Recurring suppurative osteomyelitis of head of tibia.*—Female, aged twenty-seven years; nurse in Milwaukee Hospital. Twelve years ago suffered from an attack of acute osteomyelitis about the junction of the upper with the middle portion of the tibia. A number of pieces of bone escaped at different times during a period of two years, when, finally, without operative interference, an apparent cure followed. Since then she has enjoyed good health until a few weeks ago, when she experienced a severe pain in the knee on the side of the previous attack of osteomyelitis. The knee-joint became swollen and tender. The temperature was always above normal toward evening. Rest in bed and applications of ice were of no avail in removing the swelling or mitigating the pain. Suspecting the existence of a central osteomyelitic focus in the head of the tibia, I regarded the gonitis as a secondary affection, and made a careful search for evidences of a primary affection of the bone. A circumscribed tender point to the inner side of the tubercle of the tibia was found. This place was taken as a guide, and, under strict antiseptic precautions, an opening was made toward the centre of the head of the tibia, and an abscess cavity about the size of a hickory-nut was found, centrally located, at a point between the epiphyseal line and the articular cartilage. The spongy tissue around this abscess was infiltrated, and almost the entire interior of the head of the bone had to be removed with the sharp spoon and chisel. A very thin layer of bone and the articular cartilage separated the joint from the cavity. The cavity was fully as large as a medium-sized orange. After thorough disinfection and iodoformization, this enormous space was packed with decalcified bone chips, each layer being freely dusted with iodoform. Deep and superficial sutures and capillary drainage with strings of catgut.

Primary healing of wound. The pain and swelling of knee-joint subsided completely after the operation. The patient left the hospital a few weeks after the operation. A slight superficial suppuration followed a partial reopening of the wound. The progress of repair in the interior of the bone progressed uninterruptedly, and in about three months' time definitive healing had taken place. The contour of the upper portion of the tibia has been completely preserved, and the bone at the site of operation presents a smooth and even surface. The skin is not adherent to the new bone. The functions of the knee-joint are unimpaired, and the patient has since then performed the arduous duties of a nurse without suffering the slightest pain or inconvenience.

In this case the secondary osteomyelitis was a manifestation of continuation of the primary cause, some of the pus microbes having remained in a latent condition on the proximal side of the primary seat of infection, and had again become pathogenic upon the accession of an exciting local cause or causes. As no retraction of the skin at the point of operation has taken place more than a year after the operation, it must be assumed that the entire cavity has become filled with new bone.

CASE III. *Plastic osteomyelitis of the lower end of the tibia following fracture of the fibula.*—A man, twenty-eight years old, was admitted into the Milwaukee Hospital, April 18, 1888. General health good. No hereditary predisposition. Five years ago he sustained a fracture of the fibula with severe sprain of ankle-joint. After a slow recovery from this injury he was able to walk about until two years later, when a fixed pain appeared in the lower end of the tibia, which gradually increased in severity for several months, followed by swelling and marked tenderness just above the internal malleolus. When examined the lower portion of the tibia was found uniformly enlarged, and a localized point of tenderness was detected over the inner surface of the bone just above the epiphyseal line. At this point an opening was made into the tibia, after carefully reflecting the periosteum, one-third of an inch in length and one-fourth of an inch in width, and extending its depth beyond the centre of the bone. The bone was harder than in a state of health, consequently I explored the surrounding tissue with a drill from the cavity, but failed in detecting evidences of suppuration. The cavity was filled with one large piece of decalcified bone. Wound closed by buried and superficial sutures. The pain ceased immediately after the operation and has never returned since. The wound was completely healed in two weeks. The limb was kept at rest for a number of weeks for the purpose of favoring the process of repair in the interior of the bone. The cavity has become filled with new bone, and the surface of the tibia at the site of operation presents a smooth and even surface. The osteomyelitis in this case was of the plastic variety, and hence the operation was done entirely in aseptic tissue, and it was not deemed necessary to resort to disinfection of the cavity or to iodoformization of the bone chips. The pain was evidently due entirely to tension, and was promptly relieved by the operation.

CASE IV. *Secondary central suppurative osteomyelitis of head of tibia.*—A female, thirty years old, was admitted into the Milwaukee Hospital June 5, 1888. Eight years ago I made an extensive operation for necrosis of the central and lower portion of the tibia which had followed an attack of osteomyelitis when she was a child. A number of sequestra were removed and suppurating cavities laid open. After a number of months the wound finally closed, leaving quite a defect in the bone at the site of operation with the cicatrix firmly adherent to the bone. She remained well until two months ago, when, without any apparent cause, she was attacked with a severe pain in the upper portion of the same bone. The suffering increased in intensity from day to day until the pain became so severe that opiates failed to procure relief. No swelling of the bone or soft parts could be detected, but over the anterior surface of the head of the tibia in close proximity to the knee-joint a well-defined circumscribed area of tenderness could be mapped out. The

entire limb was thoroughly disinfected and while the limb was elevated Esmarch's constrictor was applied around the thigh.

A straight incision was made parallel to the limb through the centre of the tender surface down to the bone. The periosteum was found slightly thickened and could be easily separated from the underlying bone. The bone itself was exceedingly vascular and not as dense as in a condition of health. With an ordinary drill the bone was explored in a central direction. At the depth of about one-fifth of an inch resistance ceased, and upon withdrawal of the instrument a few drops of pus escaped. The bone was now chiselled in the direction of the perforation, and near the centre of the head of the tibia on a level with the epiphyseal line an abscess cavity the size of a small walnut was disclosed. The abscess was surrounded by a zone of osteoporotic bone the meshes of which contained granulation tissue and pus. All of the tissues which presented macroscopical evidences of disease were removed with the chisel and sharp spoon. After this was done the cavity was as large as a hen's egg and in very close proximity to the knee-joint. A number of punctures were made with the sharp point of Paquelin's cautery in different directions from the cavity, for the double purpose of destroying pus microbes which might have remained and to initiate a plastic osteomyelitis. The cavity was thoroughly irrigated with a 1:2000 solution of sublimate, and after drying it it was freely dusted with iodoform. It was then packed with decalcified bone chips cut the size of a thumb-nail and thickness of blotting-paper. In making the implantation layer after layer was covered with a thin film of iodoform. The periosteum was sutured with catgut and the skin with silk, leaving only a small opening in the lower angle of the wound for capillary drainage, which was made with a catgut string tied in a bundle. The operation had the effect of relieving the pain at once.

The limb was kept as usual for the first few weeks in a slightly elevated position upon a posterior splint. At the end of the first week the dressing was removed and the wound was found in an aseptic condition. At the end of the second week superficial sutures removed, wound completely healed, except a small granulating surface where the catgut drain had been inserted. At the end of six weeks patient could walk and the head of the tibia presented a normal contour, its anterior surface being perfectly smooth and skin not adherent to bone. A minute linear cicatrix was the only thing which remained as a visible reminder of the recent extensive operation.

This case is one of many of secondary osteomyelitis of the head of the tibia that I have seen following years after a primary attack of acute suppurative inflammation of the shaft and lower extremity of the bone. The etiological relation between the primary and the secondary attack appears to be a direct one, the cause of the first attack, the pus microbes, remaining in the tissues in a latent condition in the direction of the venous and lymphatic circulation, until at a later date by some accidental cause or causes, a *locus minoris resistentiæ* is created. My own experience has taught me that the secondary attacks, as a rule, are not as intense as the first, the lesion appearing in a more circumscribed form and attended by less febrile disturbance.

CASE V. *Secondary chronic osteomyelitis of upper epiphysis and shaft of tibia.*—Male, aged thirty, admitted into the Milwaukee Hospital June 19, 1888. Family history good. Twenty-seven years ago suffered from an acute attack of osteomyelitis of tibia. Seven years ago I removed, by quite an extensive operation, a number of sequestra from the lower third of this bone. The middle third at that time was much enlarged, but as the patient experienced no pain and no sinuses were present nothing was done to this part of the bone. After many months the wound healed by granulation, leaving quite a depression over the lower anterior surface of the bone. He remained well until a year ago, when the pain recurred in the upper and middle portion of the bone, which was soon followed by the formation of several fistulous openings. On examination now, the whole shaft of the tibia and the upper epiphysis were found enormously enlarged and through the fistulous openings a probe could be introduced into the interior of the bone without detecting necrotic bone. I decided to perform Neuber's implantation of skin flaps. The operation was rendered bloodless by Esmarch's constrictor. About one-third of the entire thickness of the shaft of the tibia had to be chiselled away before it was found possible to cover the bone with the sutured skin flaps. The outer portion of the bone was as hard as ivory, while the interior of it was traversed by numerous sinuses lined with granulation tissue and containing here and there small fragments of dead bone. The head of the tibia had to be excavated almost completely before healthy tissue was reached. It contained an abscess cavity the size of a pigeon's egg. As it was found impossible to line this large cavity with a skin flap, it was packed with chips of decalcified bone.

The whole operation was performed under strict antiseptic precautions, and the extensive wound was dressed with iodoform gauze and sublimated moss, and limb confined upon a posterior splint was kept in an elevated position. On the third day the dressing was removed, as it had become saturated with bloody serum. The margins of the skin flaps had become gangrenous and suppuration had commenced. The cavity in the head of the bone also suppurated and the bone chips had to be removed. It required several months before the wound was completely healed, the longest time being required to line the cavity in the head of the bone with a healthy cicatrix.

In this case the implantation of decalcified bone chips failed because the cavity was not rendered completely aseptic by the operation. The elastic constriction produced a very disagreeable effect, inasmuch as it caused complete paralysis of sensation and it required several weeks before sensation returned.

CASE VI. *Acute osteomyelitis of lower end of the femur.*—Boy, seven years of age, was admitted into the Milwaukee Hospital June 5, 1888. Three years ago, when the child was in good health, osteomyelitis developed after a contusion of the thigh. An abscess formed and was opened by incision over the outer and middle aspect of the thigh. A few weeks later another opening had to be made over the internal condyle of the femur. The upper incision healed while the lower has continued to discharge pus. The lower posterior aspect of the femur was exposed by an incision in the line of the fistulous opening. An opening at the point of bifurcation of the linea aspera was found in the bone which led into

a cavity lined with granulations and containing a small sequestrum. The cavity was freely laid open with the chisel and the granulations were thoroughly removed with Volkmann's spoon. After thorough disinfection the cavity was iodoformized and packed with decalcified bone chips. The granulations lining the tract in the soft parts were also removed, and the deep tissues united with catgut sutures and the skin with silk. Capillary drainage with several strands of catgut. Wound and limb dressed in the usual manner. Wound healed under two dressings. Later a connective tissue abscess retarded the progress of the case, but did not interfere with the process of repair in the cavity. In the course of two months recovery was complete with perfect restoration of the bone defect.

CASE VII. *Suppurative osteomyelitis after compound fracture of tibia.*—The patient, a female, aged sixty-five years, was admitted into the Milwaukee Hospital, September 26, 1888. She was anæmic and considerably emaciated. Eighteen months ago she sustained a compound fracture of the left leg. The fracture of the tibia was about four inches above the ankle-joint, and the upper fragment had perforated the skin. The wound suppurated, but the fracture-united after the usual time. A fistulous opening communicating with the interior of the bone has remained. The patient is unable to use the limb, as she suffers from pain in the lower end of the tibia, which is greatly aggravated by attempts to walk. Some œdema about the ankle and foot. Lower end of tibia slightly enlarged and painful on pressure. The bone was exposed by a straight incision, and after reflecting the periosteum with the attached soft parts the bone was found very vascular and softened. Taking the fistulous opening as a guide, the compact layer was removed over the entire length of the cavity with the chisel. The cancellated tissue in the interior of the bone was found infiltrated with pus and permeated by granulation tissue. After removal of all diseased tissue with a sharp spoon, the cavity in the bone measured one inch in length and one-fifth of an inch in width. After thorough cleansing and disinfection with a 1 : 2000 solution of sublimate, it was dried and dusted with iodoform, after which it was packed with bone chips. Over this gutter the periosteum was stitched with catgut sutures and the external wound with silk, leaving only a small space for the insertion of a catgut drain. Pain ceased after operation. No rise in temperature. External wound healed by primary union. Six weeks after operation the patient left the hospital with the entire cavity apparently filled with bone.

The purulent infection of the bone in this case did not lead to sequestration, but to osteoporosis and the formation of an abundance of granulation tissue. The infection extended from the seat of fracture downward to the lower epiphyseal line. The walls of the cavity were composed of a thin shell of compact tissue.

CASE VIII. *Acute suppurative osteomyelitis and necrosis of upper portion of tibia.*—Male, twenty-three years of age, was admitted into the Milwaukee Hospital, January 7, 1889. Had an acute attack of osteomyelitis of the upper portion of the tibia three years ago, which led to the formation of an abscess which was opened on the tenth day. This opening never closed. A number of small pieces of dead bone have

escaped. General health good. The upper portion of the tibia is very much enlarged, and a fistulous opening situated on the inner surface of the tibia about one-fifth of an inch below the tubercle leads into the interior of the bone. After chiselling away the compact layer anteriorly in the line of the opening, it was found that the disease had taken its starting-point at the epiphyseal line and had extended upward to near the articular cartilage and downward obliquely from the inner to the outer side of the bone to a distance of one and one-fifth inches. The upper terminus of the inflammatory process was an infiltration of the cancellated tissue with pus, necessitating an excavation of a cavity the size of a walnut. The exposure of the sinus in the bone made it necessary to chisel a gutter in an oblique direction from within outward and downward one-third of an inch in width and one and one-fifth inches in length. A number of small sequestra were removed and the granulations scraped out with a sharp spoon. Disinfection and packing of the cavity with decalcified bone chips in the usual manner. Catgut drain and deep and superficial sutures. As the dressings were saturated the next day they were removed. Suppuration followed the third dressing, with the result that four weeks after the operation some of the bone chips, showing the corroding action of the granulations, escaped. At this time some of the bone chips could be seen in the cavity embedded in granulation tissue.

The subsequent course demonstrated that the chips which were in close contact with the walls of the cavity were retained while the central portion of the packing was eliminated. When suppuration ceased the cavity had nearly closed, and the gutter was filled two-thirds of its depth with vigorous granulations; after another thorough disinfection the remaining cavity was again implanted with bone chips, and in the course of another four weeks the entire surface has healed, leaving only a very slight depression on the surface of the bone.

The clinical history of this case shows that the cavity was aseptic from the beginning, and that the reparative process had progressed in a satisfactory manner for two weeks, when accidental infection occurred at the time the third dressing was made, which for a time arrested the healing process and resulted in the elimination of the central portion of the bone packing. As soon as suppuration had ceased and an aseptic condition of the granulating surfaces could be secured, secondary implantation was done and was followed by complete success.

CASE IX. *Resection of knee-joint; large tuberculous cavity in head of tibia.*—Female, aged twenty years, was treated at the Milwaukee Hospital for tuberculous arthritis of knee-joint during the year 1888. The disease had existed for several years, and, in spite of the usual treatment, continued to grow worse. The knee-joint was greatly distended by what appeared to be masses of granulation tissue. As the head of the tibia presented two well-marked points of tenderness, it was surmised that the disease had taken its starting-point in this bone, and that the knee-joint had become involved secondarily. Typical resection of knee-joint. The section made through the tibia revealed three small tuberculous cavities. Condyles of femur healthy. A careful inspection of the sawed surface of the tibia revealed at one place osteoporotic bone, and exploration at this point disclosed another deep-seated tuberculous focus,

the removal of which resulted in the formation of a cavity the size of a walnut. This cavity was packed with bone chips before the resected surfaces were brought in apposition. Complete healing under two dressings. Firm bony union in the course of two months. Good use of limb and no relapse to date. That the filling of the cavity with decalcified bone chips expedited bony consolidation, there can be no doubt, as with the removal of the implanted chips the osteoporotic material invaded the cavity and approached the resected surface of the femur, furnishing a considerable portion of the intermediary callus.

CASE X. *Chronic circumscribed suppurative epiphyseal osteomyelitis of tibia.*—Male, aged eighteen years, was admitted into the Milwaukee Hospital March 13, 1887. For the last three years the patient has suffered at times from a severe pain just above the ankle-joint. At different times he has been treated for sprain of the ankle or rheumatism. During the last few weeks the pain has become so severe that he was unable to walk, and had to take opiates to procure sleep. No history of tuberculosis or syphilis. At a point corresponding to the lower epiphyseal line of the tibia some swelling and increased local temperature. About the centre of the swelling great tenderness on pressure. On making an incision down to the bone through the centre of the swollen part the periosteum was found very much thickened. On removing the compact tissue with the chisel an abscess cavity the size of a hazelnut was found in the centre of the bone, immediately above the epiphyseal line. As the bone around the cavity showed evidences of disease it was scraped out with a sharp spoon until the cavity was as large as a walnut. Disinfection and iodoformization of cavity followed by implantation with decalcified bone chips. Double row of sutures and capillary drainage with catgut. External wound healed under first dressing. Later some suppuration in connective tissue about the wound, which, however, did not affect the healing process in the cavity, which was completed at the end of six weeks.

IV. GENERAL DIRECTIONS FOR TREATMENT OF BONE DEFECTS BY IMPLANTATION OF ANTISEPTIC DECALCIFIED BONE.

1. *Decalcification and disinfection of bone.* A fresh tibia of an ox is the best material for decalcification. The bone is cut in sections two inches in length, and, after carefully removing the medullary tissue, is kept in dilute muriatic acid, the fluid being changed every few days until the process of decalcification has been completed. After this has been accomplished the bone can be readily cut into pieces about one millimetre in thickness, making the sections parallel to the long axis of the bone. The acid is then removed by washing and by keeping the bone immersed in a weak solution of caustic potash. The bone is then rendered antiseptic by keeping it until it is needed in a solution of sublimate in alcohol 1 : 500 in a wide-mouthed bottle, which is kept hermetically sealed by a glass stopper to prevent evaporation of the solution. When the bone is needed, it is taken from the bottle and placed in a five per cent. solution of carbolic acid, or a weak solution of sublimate. In making the plates or disks for filling a cranial

defect the bone is cut so as to correspond in thickness to the bone removed, and accurately to fit into the opening. A number of small perforations in the disk or plate should always be made, as through these openings the space underneath the bone is kept drained; at the same time the early entrance of granulation tissue into these openings effects fixation of the bone *in situ* and favors the early removal of the implanted substance by substitution with permanent living tissue. Before implantation both sides of the plate should be dusted with iodoform. For packing bone cavities the decalcified bone should be cut in thin slices or chips, which should be laid upon a compress of aseptic gauze, so as to remove the surface moisture, when they are dusted with iodoform before they are implanted into the cavity. Aseptic decalcified bone drains, in the absence of more suitable material, can be used in packing bone cavities.

2. *Asepsis at the seat of implantation.* The most essential condition for success in the treatment of bone defects by implantation of decalcified bone is a perfectly aseptic condition of the tissues to be brought in contact with the implanted bone. This condition is easily procured in operations on bones for lesions other than those caused by infection with pus microbes, such as tumors, parasites, and tuberculous and syphilitic affections uncomplicated by suppuration. In the surgical treatment of these affections after the removal of the diseased tissue the seat of operation must be aseptic if the ordinary precautions in the prevention of infection from without have been observed. In such cases speedy healing of the external wound and the early partial or complete reproduction of the lost bone are assured.

The next most favorable cases for this procedure are circumscribed osteomyelitic processes in the epiphyseal extremities of the long bones as we observe them in cases of primary circumscribed epiphyseal osteomyelitis, or in the form of a recurring attack in the same place, perhaps years after a diffuse osteomyelitis of the entire shaft. Under such circumstances the inflammatory focus can be located externally by the presence of a circumscribed area of tenderness, and the tender spot constitutes the guide in the search for the abscess. The seat of inflammation is freely exposed with a chisel and the walls of the abscess cavity are scraped out with a sharp spoon until healthy tissue is reached all around. The precaution should be taken to wash out the cavity with an antiseptic solution before attacking the abscess wall so as to prevent the contamination of the healthy tissue with the products of the infection by the mechanical diffusion of the pus microbes. For the final disinfection of such a cavity a strong solution of sublimate is used, and after thoroughly drying its walls it is dusted with iodoform. Iodoformization of the cavity and the implantation of antiseptic bone chips are measures which are well calculated to resist the pathogenic action of

pus microbes which might still remain, and in the majority of cases will secure an aseptic healing of the wound.

This method of treating bone cavities is also applicable after operations for necrosis resulting from a previous attack of acute suppurative osteomyelitis. With a view to obtain an aseptic condition of the cavity it is necessary that the line of demarcation between dead and living tissue should have formed, the involucrum must be well developed and the soft parts in a healthy condition. The operation which precedes the implantation must accomplish more than the simple extraction of the necrosed bone, it implies the removal of all infected tissue lining the interior of the involucrum and the fistulous tracts in the soft tissues. The involucrum must be laid open with the chisel sufficiently to expose to sight and direct treatment its entire interior for the purpose of removing with the sharp spoon all of the infected granulations, at the same time the fistulous tracts in the soft tissues must be made accessible to the same treatment. After the thorough mechanical removal of all infected tissues the wound surfaces must be irrigated freely with a hot solution of sublimate, and for final disinfection a twelve per cent. solution of chloride of zinc may be applied with a brush, after which the cavity is flushed again, dried, and iodoformized. In operations for acute diffuse osteomyelitis all known surgical resources are inadequate in rendering the field of operation aseptic, and hence contraindicate the subsequent treatment by implantation with decalcified bone.

3. *Necessity of performing the operation by bloodless method.* I have previously made the statement that in the implantation of a disk or plate of bone into a defect in the skull the hemorrhage from the brain and its coverings should be carefully arrested before the implantation is made, as otherwise compression of the brain might arise from accumulation of blood underneath the implanted bone. The disk or plate may be relied upon in arresting hemorrhage from the vessels in the bone which by other measures it is sometimes found difficult to control. In the treatment of bone cavities in regions where it is possible to render the operation bloodless by elastic constriction, this should always be resorted to, as it prevents unnecessary loss of blood during the operation and enables the surgeon to resort to means and measures for procuring an aseptic condition, which otherwise it would be impossible to apply with the same degree of thoroughness and efficiency. Unless special indications present themselves the elastic constriction is continued until after the dressing has been applied.

4. *Implantation.* In the treatment of a bone cavity by implantation with decalcified bone, the chips are poured into the cavity and are packed quite firmly until the surface of the cavity is reached. The bone chips act as an antiseptic tampon which arrests the free oozing from the surface of the bone which always takes place after the removal

of the constrictor. Some blood escapes between the bone chips and coagulates at once, thus forming a desirable and useful cement substance, which permeates the entire packing and temporarily glues, as it were, the chips together and the entire mass to the surrounding tissues.

5. *Treatment of external wound.* The periosteum should be carefully preserved in exposing the bone and, after the implantation, is sutured over the surface of the bone chips with catgut sutures. If the bone is deeply located, it may become necessary to apply another row of buried sutures in bringing into accurate apposition other soft parts. The skin is finally sutured with silk. It is of great importance to secure accurate apposition of the divided soft parts in order to preserve for the subjacent bone all of its natural coverings.

6. *Drainage.* In some instances it would be undoubtedly superfluous to secure any form of drainage, as when the cavity is perfectly aseptic and hemorrhage is not in excess of requirements, healing of the entire wound would be accomplished under one dressing. Experience, however, has taught me that tension arising from extravasation of blood often exerts an injurious influence upon the process of healing and should be carefully avoided. As it is desirable to heal as much of the wound as possible without interfering with drainage I have invariably introduced an absorbable capillary drain in the lower angle of the wound. A string of catgut twisted into a small cord answers an admirable purpose.

7. *Dressing of wound.* The wound is covered with a strip of aseptic silk over which a few layers of iodoform gauze are applied. Over this a cushion of sublimated moss is placed with a thick layer of salicylated cotton along its margins for the purpose of guarding more securely against the entrance of unfiltered air; the whole of it is retained by a circular bandage of gauze evenly and smoothly applied. For the purpose of securing absolute rest for the limb it is placed upon a posterior splint and kept in a slightly elevated position. If no indications arise, the first dressing is not removed for two weeks, when the entire wound will usually be found healed, except a few granulations at the place where the catgut drain was inserted. A smaller antiseptic compress is applied and the limb dressed in a similar manner. It is advisable to enforce rest not only till the external wound has healed, but until the whole process of repair has been completed, which embraces a period varying from four weeks to three months, according to the size of the cavity and the age of the patient.

8. *Secondary implantation.* If an operation is followed by suppuration the result of imperfect antiseptic tubular drainage must be established and the same treatment pursued as in suppurating wounds. If suppuration takes place soon after the operation and is profuse, it is probable that all of the bone chips will be lost. If it develops after

granulation tissue has had time to form and the purulent discharge is moderate in quantity, the prospects are that the bone will remain and serve its purpose as a nidus for the granulation tissue. In such cases an antiseptic irrigation should be made every three or four days until suppuration has ceased. If the bone chips are lost by suppuration or have to be removed for the purpose of a more thorough disinfection of the cavity, no attempt should be made at re-implantation until suppuration has been arrested, or, in other words, until the cavity has become lined with granulations, and is in a comparatively aseptic condition, when the time for secondary implantation has arrived. After the cavity has been irrigated with a strong antiseptic solution it is dusted with iodoform and the granulations are scarified in a number of places for the purpose of obtaining a sufficient amount of blood to fill the spaces between the bone chips, which are implanted in the same manner as in the treatment of a recent cavity. Complete closure of the external wound under these circumstances is seldom obtainable and the surface of the exposed portion of the cavity should be provided with a thin layer of Schede's moist blood-clot. The antiseptic properties of the material used in packing the cavity exerts a potent influence in maintaining asepticity after secondary implantation.

CONCLUSIONS.

1. Antiseptic decalcified bone is the best substitute for living bone grafts in the restoration of a loss of substance in bone.

2. In the treatment of bone cavities, antiseptic decalcified bone is preferable to Schede's blood-clot, as it is not only a perfectly aseptic, but at the same time, also a strongly antiseptic substance.

3. Implantation of a disk or plate of antiseptic decalcified bone into a cranial defect may be relied upon as a hæmostatic measure in arresting bleeding from the vessels of the diploë, it constitutes a good temporary substitute for the lost portion of the cranium, it prevents the direct union of the brain or its envelopes with the pericranium, and, finally, it furnishes the most favorable condition for the production of new bone from the margins and the closure of the remaining defect by a firm and unyielding membrane.

4. The packing of an aseptic bone cavity with chips of antiseptic decalcified bone guards against unnecessary loss of blood and exerts a potent influence in the prevention of infection by pus microbes that might have remained upon the surface of the wound or in the tissues.

5. Capillary drainage by an absorbable drain should be established after implantation for the purpose of preventing the accumulation of more blood in the wound than is necessary to form a temporary cement

substance between the bone chips and between the contents of the cavity and the surrounding tissues.

6. In the treatment of an aseptic bone cavity by implantation of chips of antiseptic decalcified bone, the packing answers the purpose of an antiseptic tampon and furnishes the best medium for the growth and development of the tissue resulting from the regenerative process initiated by the trauma.

7. Secondary implantation can be successfully practised in the treatment of a suppurating bone cavity after suppuration has ceased, and the cavity can be transformed into the same favorable conditions for healing as an aseptic wound.

THE VALUE OF CREOLIN, HYDRONAPHTHOL, AND SODIUM FLUOSILICATE AS GERMICIDES.¹

BY CHARLES J. FOOTE, M.D.,
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SODIUM fluosilicate and hydronaphthol are often used as germicides, but their germicidal properties, so far as I can learn, have never been demonstrated. They have both been shown to be efficient antiseptics.

The germicidal and antiseptic properties of creolin have been tested by Esmarch, Eisenberg, and others. It has been demonstrated to be a germicide of nearly equal power with carbolic acid.

The following experiments were undertaken to determine the germicidal power of sodium fluosilicate, hydronaphthol, and creolin as compared with one another and as compared with some of the older germicides which they tend to supplant, such as the bichloride, carbolic acid, and thymol.

METHOD.—The bacteria used to test the germicidal power were the bacillus typhosus, the pneumococcus (Friedländer's), the streptococcus erysipclatis (Fehleisen), the staphylococcus pyogenes aureus, and those of decomposing beef bouillon which had been previously sterilized and then exposed to the air of the laboratory for two weeks. Pure cultures were then made in sterile beef bouillon of the B. typhosus, streptococcus erysipclatis, and pneumococcus.

The staphylococcus pyogenes aureus does not grow readily in beef bouillon, therefore a pure culture of this was made in nutrient gelatine which had been steamed so long that it remained liquid. In this the staphylococcus grows abundantly.

¹ The experiments given in this paper were performed in the bacteriological laboratory of the Yale Medical School.

Solutions were then made of the following germicides :

Bichloride, 1 to 10, 000.

Bichloride, 1 to 2000.

Carbolic acid, 2 per cent.

Creolin, 2 per cent.

Creolin, 1 to 1000.

Hydronaphthol, saturated aqueous solution (1 to 1150).

Sodium fluosilicate, saturated aqueous solution (1 to 120).

Sodium fluosilicate, 1 to 1000.

Thymol, saturated aqueous solution (1 to 1200).

Resorcin, 2 per cent.

One cubic centimetre of one of the antiseptics was placed in a sterilized test-tube with a sterilized pipette, and one cubic centimetre of one of the cultures was lowered with a sterilized pipette into the test-tube and allowed to flow into the antiseptic. Care was taken in introducing and withdrawing the pipette not to touch the sides of the test-tube. The tube was then plugged with sterilized cotton, and at the end of one-half hour and two hours, inoculations were made from it into tubes of sterilized beef bouillon, except in the case of the staphylococcus pyogenes aureus, when the inoculations were made into the fluid nutrient gelatine.

The inoculations were made by means of a long platinum needle, the end of which had been twisted into a spiral. With this a good-sized drop could be taken out of the culture which had been mixed with the germicide, and transferred to a test-tube of sterile beef bouillon.

The transfer, if properly manipulated, need take but a few seconds, and the cotton plugs are immediately replaced in the tubes. If the tubes are held well inclined toward a horizontal line, there is little danger of contamination from the air during manipulation. In fact, the danger of infection from any source other than the culture mixture is very slight. I have proved this by going through the same manipulation and inoculating sterile fluids into sterile bouillon. I have done this over fifty times and have never had one of the tubes of sterile bouillon break down.

The tubes of sterile beef bouillon which had been inoculated from the culture mixtures were then placed in an incubator and kept at a temperature of 40° C. (104° F.), and watch kept for the first signs of cloudiness, which indicates the growth of bacteria.

Since an equal part of the fluid culture was added to the solution of each antiseptic, this was diluted one-half and consequently the strength of each of the antiseptics tested was just one-half the strength of the original solution.

Two different strengths of sodium fluosilicate and creolin solutions were used, that the limits of their germicidal power might be roughly determined in case the stronger solution proved to be a germicide. A 1 to 2000 solution of the bichloride was used as a check, since if any

tubes inoculated from mixtures of this broke down there would be a probability of some error in the method.

The fact that tubes inoculated from mixtures of this always remained sterile proved the absence of infection from without.

CONCLUSIONS.—Below is a table of the results obtained after an exposure of one-half hour and of two hours.

		Sodium fluo- silicate, 1 to 2000.	Sodium fluo- silicate, 1 to 240.	Thymol, 1 to 240.	Hydronaphthol, 1 to 2300.	Creolin, 1 to 2000.	Creolin, 1 per cent.	Bichloride, 1 to 20,000.	Bichloride, 1 to 4000.	Resorcin, 1 per cent.	Carbolic acid, 1 per cent.
Staphylococcus pyogenes aureus	{ ½ hr. 2 hrs.	Cloudy "	Cloudy "	Sterile "	Cloudy "	Cloudy "	Sterile "	Sterile "	Sterile "	Cloudy "	Sterile "
Pneumococcus	{ ½ hr. 2 hrs.	Cloudy "	Cloudy "	Sterile "	Cloudy "	Cloudy "	Cloudy "	Sterile "	Sterile "	Cloudy "	Sterile "
Streptococcus erysipelatis	{ ½ hr. 2 hrs.	Cloudy "	Cloudy "	Sterile "	Cloudy Sterile	Cloudy "	Sterile "	Sterile "	Sterile "	Cloudy "	Sterile "
Bacillus typhosus	{ ½ hr. 2 hrs.	Cloudy "	Cloudy "	Cloudy Sterile	Cloudy "	Cloudy "	Sterile "	Sterile "	Sterile "	Cloudy "	Sterile "
Beef bouillon	{ ½ hr. 2 hrs.	Cloudy "	Cloudy "	Sterile "	Sterile "	Cloudy "	Sterile "	Sterile "	Sterile "	Cloudy "	Sterile "

It will be observed that the only two germicides invariably sterilizing each culture are the two solutions of the bichloride (1 to 20,000 and 1 to 4000), and the solution of carbolic acid (1 per cent.). It will further be observed that tubes inoculated from mixtures of sodium fluosilicate (1 to 2000 and 1 to 240), of resorcin (1 per cent.), and of creolin (1 to 2000) invariably broke down; consequently we may dismiss sodium fluosilicate, resorcin, and creolin (1 to 2000) from our consideration, with the conclusion that they are of little value as germicides.

The remaining ones to consider are creolin (one per cent.), thymol, and hydronaphthol; and of these thymol evidently ranks first, only one tube in ten breaking down. Creolin (one per cent.) ranks next, and appears to be a good germicide in a one per cent. solution, but not quite strong enough in this solution to destroy the pneumococcus, although efficient against the other bacteria used.

Hydronaphthol in a 1 to 2300 solution possesses a little germicidal power, three tubes out of ten remaining sterile.

Placing these antiseptics in the order of their germicidal powers in the strength of the solutions tested, we have:

- (1) Bichloride, 1 to 20,000.
- (2) Carbolic acid, 1 per cent.
- (3) Thymol, 1 to 240.

- (4) Creolin, 1 per cent.
- (5) Hydronaphthol, 1 to 2300.
- (6) $\left\{ \begin{array}{l} \text{Sodium fluosilicate, 1 to 240.} \\ \text{Resorcin, 1 per cent.} \\ \text{Creolin, 1 to 2000.} \end{array} \right.$

USES.—Antiseptics are of value where long action is required to prevent the growth of bacteria while repair goes on in the tissues ; they are, therefore, useful substances with which to impregnate surgical dressings. Germicides are useful where rapid action is demanded, and where the fluid remains in contact with the infected area for a short time only ; they are therefore useful for irrigating wounds, for sprays, for douches, for washing the hands, and for the sterilization of instruments.

The term germicide implies sterilization, while the term antiseptic implies sepsis with retardation or absence of development.

An antiseptic, unless also a germicide, can be of no value, except as so much water, for washing a surgeon's hands or instruments, or for irrigating or douching.

This distinction needs to be observed, since many antiseptics, such as sodium fluosilicate and hydronaphthol, are used for douching, irrigating, washing hands and instruments, when sterilized water would be just as efficient and even more so, since antiseptic solutions may not themselves be sterile and consequently may convey infection.

Creolin, according to my experiments, ranks far above sodium fluosilicate and hydronaphthol. Though insoluble in water, it forms an emulsion with it which possesses all the antiseptic and germicidal properties of a solution. My experiments show it to have very nearly equal germicidal properties with carbolic acid, comparing equal per cent. solutions ; but its toxic properties have been shown to be considerably less, and therefore its available germicidal strength is greater than that of carbolic acid.

Creolin has been used for sterilizing instruments, but there are certain objections to its use for this purpose. Being an opaque fluid, instruments put in it are found with difficulty during an operation ; the same characteristic is an objection to its use for irrigating during operations, in that it obscures the parts operated upon. It also renders the handles of instruments slippery, as if they had been dipped in oil.

As carbolic acid can be used as strong as five per cent. for sterilizing instruments, it would seem to be the best germicide for this purpose, since it furnishes a clear solution which is a powerful germicide and does not injure surgical instruments.

Perhaps the best uses to which creolin can be put are for washing the hands and for vaginal douches. A five per cent. solution of creolin does not benumb the hands as carbolic acid does, and does not crack and

roughen them as the bichloride does, but renders the skin smooth and supple.

The great value of vaginal and intra-uterine douches of the bichloride in the prophylaxis and treatment of puerperal septicæmia is undoubted. The mortality from puerperal septicæmia since their introduction has decreased from 5 per cent. to 0.34 per cent. There is, however, considerable danger of mercurial poisoning from their continued use. Stieffek has reported cases of poisoning from douches of solutions of 1 to 3000 and 1 to 4000.

Virchow has reported a case of mercurial poisoning terminating in death, due to three intra-uterine douches, each containing one quart of a solution of 1 to 1000 of the bichloride, one douche being given each day for three successive days. The use of the bichloride douche in nephritis is always contraindicated.

Although the stronger solutions of the bichloride (1 to 1000 or 4000) are unsafe for continued intra-uterine douching, it would seem that a solution of 1 to 20,000 would be safe and efficient, especially if tartaric acid is added to the solution. A quart of this used in a douche would contain a little less than a grain of the bichloride, and since it would be held in solution by the tartaric acid, it would mostly flow away and not be precipitated on the endometrium.

Carbolic acid is often substituted for the bichloride for the intra-uterine douche, but it cannot be used stronger than three per cent., and even this for continued use would be unsafe.

A three per cent. solution of creolin thus far has proved a safe and efficient germicide for this purpose and a five per cent. solution can probably be used with safety. Creolin has the additional advantages of possessing hæmostatic properties and limiting secretions.

Creolin has been used in certain diseases of the eye and ear with success, but in solutions too weak to have any germicidal effect.

In conclusion, my investigations tend to show that for ordinary surgical use we have not in aqueous solutions of sodium fluosilicate and hydro-naphthol germicides approaching in power weak solutions of the bichloride or one per cent. solutions of carbolic acid; that creolin possesses germicidal properties nearly equal to carbolic acid, and that it may properly be substituted for it for washing the hands and for intra-uterine and vaginal douches.

POLIOENCEPHALITIS SUPERIOR (NUCLEAR OPHTHALMO-
PLEGIA) AND POLIOMYELITIS.¹

By B. SACHS, M.D.,

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It is a rare experience in neurological matters to have the pathology of a disease unravelled as quickly as was done in the case of those clinical groups of symptoms which we know as ophthalmoplegia externa and interna.

The paralysis of the muscular apparatus of the eye was soon discovered to be due, in most cases, to a lesion or lesions affecting the nuclei of the nerves which govern the various ocular muscles. In this nuclear paralysis, the nuclei of the oculo-motor nerves play a most important rôle, though the nuclei of the fourth and sixth nerves are involved frequently enough. Our knowledge of the pathological processes resulting in such lesions was gained by showing first of all that all the cranial nerve nuclei were subject to the same acute and chronic affections, and that what we ordinarily call progressive bulbar paralysis was, as far as its pathological character is concerned, exactly the same as the progressive paralysis affecting the ocular nuclei.

The relation of the bulbar process to poliomyelitis was firmly proved by cases of bulbar paralysis which were associated with symptoms resembling those of a progressive muscular atrophy or a chronic anterior poliomyelitis, and furthermore by cases of typical progressive muscular atrophy which, in their terminal stages, developed bulbar symptoms.

On the strength of this clinical analogy, Hutchinson, Mauthner, and Birdsall were struck with the pathological resemblances between the diseases affecting the ocular and spinal nuclei; and Wernicke proposed to call the affection of the oculo-motor nuclei a polioencephalitis superior, whence it followed that the bulbar paralysis might well be styled polioencephalitis inferior. While the analogy with poliomyelitis had been proven beyond the shadow of doubt for the bulbar cases, Wernicke's theory needed further proof as regards the cases of total ophthalmoplegia externa and interna. Heretofore but one case has been recorded (by Seeligmüller) in which the symptoms of a chronic poliomyelitis were associated with those of polioencephalitis superior, and with the exception of the cases of Hensch and Buzzard² in which an ocular (nuclear) paralysis occurred in the course of an acute

¹ Read before the American Neurological Association, June, 1889.

² Quoted by E. Blanc, Arch. gén. de Méd., Janv. 1887.

poliomyelitis anterior, I know of no cases which exhibit this interesting association of symptoms. The case which I report here proves rather conclusively that the same pathological process may give rise to a typical polioencephalitis superior and to chronic or subacute poliomyelitis anterior.

The history of this case is as follows:

H. M., æt. forty, is a man of robust build, unusually intelligent, and one who has experienced all the vicissitudes of life. He was born in this city, and has been married fourteen years. Has one brother living and healthy, and one brother who died from want of water, as the patient says, on the desert of Arizona. Both parents are dead; the father died of yellow fever in New Orleans in 1858; the mother died of a paralysis which lasted seven or eight years and began by turning-in of both feet. The paralysis of the legs became complete; she died at the age of seventy-four. The patient went to school at Syracuse, N. Y. As a boy had frequent "bilious" attacks associated with headaches and vomiting, was otherwise in robust health. He attended school until the age of twelve; went to New Mexico at the age of fourteen, and there learned a trade.

When sixteen years of age, one day after reading several hours got up to stretch himself, but fell back unconscious against a hot stove, burning the left temple severely—the scar is visible at the present day. He was insensible for several hours and was then put to bed; knew nothing of what had happened until he saw doctors around; no paralysis followed. A second similar attack, again after reading, occurred three months later, from which he quickly recovered. A third attack occurred, but the date of this he cannot recall. No further sickness until the age of twenty, when he was in Peru and was steward on a United States steamer. While on shore he fell from a horse, striking the right elbow and injuring the arm. Recovered completely from this fall.

At the age of twenty-five was in Europe; felt one day a severe pain in the left eye; engaged passage at once for New York, reaching there a few weeks later. By that time the left eye was closed. Went to sea again (to Australia on a sailing vessel), and during this trip noticed that the right lid was also beginning to droop. He was treated in Melbourne by electricity, but the condition remained stationary for several months. After that a slight improvement is said to have set in in the left eye, but the right eye grew worse; both pupils were dilated (physician's statement). Had double vision all the time, and small ulcers formed on the left eye. The Australian physicians suspected tumor of the brain. He had severe headaches at the time; the left eye became inflamed and was in such a bad condition that the physician advised enucleation, but the patient objected. After a short trip at sea, the inflammatory condition was at an end.

It was about this time that he began to be suspicious of his legs, for one day while walking on the deck his right knee gave way. A few days later the same accident occurred. Nevertheless he joined a ship from Australia to California. When thirty days out, he had to refuse duty as steward, as he could not move his right thigh, leg, or toe a single inch. The captain ordered hot steam bath, and gave him blue pill and black draught. He went to Oregon next—now thirteen years ago. He

remembers that when there he could not hold water nor contain feces. His left leg was not affected at any time. Iodide treatment was proposed; patient objected on the ground that he had never had any syphilitic affection. In consequence of the paralysis of the right leg he was compelled to go about on crutches. The doctor who examined him found a sensitive point between the shoulder-blades and ordered blisters, and strychnine internally. In six months time he was able to walk with the assistance of a stick; he could use the hip and knee joint, but could not move ankle or toes. The eyes remained in about the same condition; he was not worried by them. He undertook contract work on a railroad in Panama, and there contracted severe malaria.

One year and a half ago he was stricken down with prolonged fever. As soon as he recovered from this he travelled about considerably; finally went to Jacksonville, where he got a thorough drenching, which was followed by severe chill. One day he tried to read the papers but could not see anything. Last year, on his return to New York he was examined by Dr. E. Grüning, who performed an iridectomy of the right eye which did not improve vision. Later on, Dr. Grüning raised the left eyelid by operation and restored vision to that eye. Went to Panama in May, 1888, and returned to New York about seven weeks ago.

For the past four weeks he has been an inmate of the Montefiore Home for Chronic Invalids, where I have had the opportunity of studying the case. He denies ever having had gonorrhœa or syphilis, and an examination of his body reveals no symptoms of the latter. Has been moderate in sexual matters and has never been a hard drinker. Has smoked innumerable cigarettes for years. No loss of consciousness has occurred since the attacks recorded above. Does not suffer from headaches and but for the condition of his eyes and of his right leg would feel entirely well.

Present condition.—Strong, well-built man; heart sounds normal; no enlargement of liver, slight enlargement of spleen; other thoracic and abdominal organs normal. The most striking feature of the patient's appearance is the double ptosis, at present more marked on the right than on the left, in consequence of the operation on the left eyelid. Slight lateral nystagmus of right eye; in this eye also maculæ corneæ, old iritis with exclusion of pupil, small coloboma upward. Right pupil is not visible, left pupil dilated. A transparent, thin membrane has grown upward, covering nearly one-half of left pupil. The results of my examination of the eyes, which were kindly corroborated by Dr. E. Fridenberg, are as follows:

O. D.—Paretic—rectus internus, rectus externus, and inferior oblique. Paralyzed—levator palpebrarum, rectus superior, obliquus superior, and rectus inferior. Associated movements with the left eye do not differ from those attempted singly.

O. S.—Paretic—rectus externus, rectus internus, and superior oblique. Paralyzed—levator palpebrarum, rectus superior, rectus inferior, and obliquus inferior. Paralysis of iris (light reflex abolished), ciliary muscle normal. Accommodation reflex good. Media apparently clear in both eyes. Vision, left eye, $\frac{20}{C}$. Right eye = 0.

Ophthalmoscopic examination.—Left papilla normal; right papilla cannot be examined.

No change in the facial distribution. Hearing normal on right side; on left side somewhat diminished, but normal bone conduction. Tongue

protruded straight, slight fibrillary movements. Sensation of face and tongue normal in every particular. Smell and taste normal on both sides. The left arm appears to be slightly larger than the right, but grasp is equally strong on both sides. Sensation normal to touch and pain. Distinguishes numbers written on arm with greatest ease. No reflexes to be obtained in upper extremities. No difficulty in respiratory or abdominal muscles.

FIG. 1.



FIG. 2.



Subject attempting to look to extreme right.

Showing atrophy of right leg.

Lower extremities.—Marked atrophy of right leg from hip downward. Largest circumference on right side; hip, 14½ inches; left side, 19½ inches; right calf, 10 inches; left calf, 12½ inches. Patient can flex knee very little, but cannot move toes of the right foot. Walks by exclusive use of posterior thigh and leg muscles. Muscular excitability lost in right thigh. No disturbance in sensation except apparent diminution of pain sense on inner aspect of right thigh. The left thigh and leg muscles show normal myotatic excitability and absolutely normal sensation. No change to be noted in any respect in leg of left side. There is no ataxia of either leg and none in the upper extremities. No Romberg symptom. The knee-jerks are lost on both sides and cannot be elicited by Jendrassik's method. All cutaneous reflexes sluggish but present.

The electrical examination reveals no changes in any of the muscles of the face, of the upper extremities, or of the trunk, nor in the left leg, but marked degeneration reaction exists in the anterior thigh and leg muscles. The vasti and anterior tibial muscles are atrophied to such an extreme degree that no reaction could be obtained with currents at command.

This history can be summarized in a few words: A man in perfect health, without any specific alcoholic or hereditary taint, is affected with

a slowly developing paresis or paralysis of all of the ocular muscles. This condition is scarcely fully established before a weakness of the right leg is noticed by giving way of the knee. This weakness is developed into a most marked paralysis associated with extreme atrophy. The symptoms remain restricted to the right leg, become retrogressive, and have not to this day affected the opposite leg. The arms remain entirely normal. The transitory bladder and rectal symptoms were probably due to an extension of the inflammation of the gray matter, and do not imply, to my mind, the existence of a transverse myelitis, acute, subacute, or chronic. No other interpretation can be put upon these symptoms except to say that in the course of a chronic nuclear paralysis of the eyes a subacute poliomyelitis set in. Both in the eyes and in the leg the disease developed in the same fashion and has practically remained stationary for years.

It will hardly be necessary in this paper to prove the diagnosis of subacute poliomyelitis in this case, and considering the rarity of poliomyelitis in the adult it would be strange indeed if the occurrence of such an affection in the course of a polioencephalitis superior were a mere coincidence. It seems to me to prove positively that the ganglion cells of the anterior horns of the spinal cord are subject to the same pathological changes as the large nuclear cells on the floor of the third and fourth ventricles.

In the case which Seeligmüller described, the upper and lower extremities were the parts first to be affected, and secondarily an affection of the eye, right and left oculo-motor nerves, set in. In this case there would seem to be a spreading by contiguity; and yet the third, fourth, and sixth nuclei were affected before the seventh, tenth, eleventh, and twelfth nuclei. The absence of such contiguity in my case does not argue, I think, against the supposition that the leg and eye symptoms are dependent on the same pathological process. It is a peculiarity of this morbid process that it is selective, that in some cases it affects parts contiguous with one another, but that again in other cases it does not spread in this manner. In some instances the upper extremities are affected and with these the ocular muscles, showing that the bulbar nuclei have not been similarly affected. The bulbar nuclei and oculo-motor nuclei may be affected without an involvement of the sixth and seventh nuclei, and among the various cell groups constituting the oculo-motor nuclei we find that the pathological process may attack portions of the nuclei which are situated at the extreme anterior and posterior limits of the nucleus and skip cell groups lying in between. This is in close keeping with the pathological condition we meet with in cases of poliomyelitis anterior, for we see too many of these cases not to know that contiguous muscles often escape paralysis and atrophy, simply

because their representative ganglion cells in the spinal cord have not been affected like their immediate neighbors.

The involvement of the iris in the one eye (the condition of the other could not be examined) takes my case out of the category of cases of ophthalmoplegia externa. According to most authors, an ophthalmoplegia externa, with paralysis of the iris, would compel one to refer the lesion to the base of the brain, but since Westphal and Spitzka have plausibly shown that the nuclei for the accommodation and light reflex lie anteriorly and away from the remaining oculo-motor nuclei, it is readily seen that these nuclei also, one or both, may be affected by the extension of the inflammatory process. It is in this way that I explain the affection of the iris in this case. Since the accommodation reflex remained normal, it is natural to infer that the ciliary and iris nuclei must be some appreciable distance apart. We must be careful, however, not to be too positive in such assertions, for Thomsen has recorded cases in which there were distinct paralyses of various ocular muscles with only the slightest involvement of a few of the nuclear cells, and, strangest of all, one case of paralysis of associated vision upward due to a gummatous infiltration of the *oculo-motor root fibres*, whereas the nuclei were found entirely normal. It is for this reason also that I believe that the determination of the exact location of the various subdivisions of the oculo-motor nucleus on clinical grounds only,¹ has been carried too far. This question can be settled in no other way but by the experimental method, or by noting to what extent clinical and post-mortem records tally.

One other point in the case demands explanation: the knee-jerk is absent on both sides. The first suspicion was that of an accompanying tabes dorsalis, as in Westphal's well-known case; but this supposition must be abandoned, since a close examination with this end in view has shown the absence of every other important symptom of tabes. The absent reflex on the left side must therefore be regarded as the only evidence of the extension of the process in the spinal cord to the left half of the cord, but at the same time the normal condition of the muscles, the normal electrical reactions, and the total absence of atrophy prove that that side can be affected but very little.

The chief value of my case is, that it proves the close relationship between the gray matter at the floor of the third and fourth ventricles and the anterior gray horns of the spinal cord.

Wernicke choose the term polioencephalitis superior wisely enough; but Strümpell's polioencephalitis, a supposed cortical disease, has caused some confusion. Strümpell's theory and disease lack proof, and for the

¹ Starr, Journal of Nervous and Mental Diseases, May, 1888.

present we need not decide whether we shall have to add a polioencephalitis suprema to polioencephalitis superior.

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A COMPARATIVE REPORT OF THE STATISTICS OF AMPUTATION, DURING AND PRIOR TO ASEPTICISM.

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It has been my endeavor, in the following paper, to present a fair synopsis of the results obtained in amputation, both prior to and during the *aseptic period*—the latter condition being a state of affairs brought about by the antiseptic methods in vogue at the present day—and to show by actual comparison the improvement the change has wrought in the mortality resulting from this operation.

The cases herein tabulated are all compiled from the reports of the London Hospitals, unless otherwise stated, as it has been found impossible to obtain enough material from similar American institutions to make a comparison of the old and new methods of much scientific value, owing to the general late adoption of the antiseptic treatment by the hospital authorities here.

The mortality after operation has been gradually diminishing since the art of surgery has become a science. This has been due not only to the improvements in operative surgery in general, but also to the use of anæsthetics; the perfection of the railway system, which permits an early inspection of the patient by the surgeon; and, finally, the accommodations offered to such cases in the numerous hospitals scattered over the land, where, with careful nursing by trained nurses, and the constant presence of the house-surgeon, dangers can be readily met and guarded against which formerly proved fatal for want of these facilities.

Nothing has caused such a wonderful decrease in the mortality resulting from this operation, however, as *asepticism*, brought about by the present modified Listerian method of antiseptic treatment of all wounds. If it were possible to get absolute cleanliness, we could get along without

antiseptic appliances;¹ but as this is not possible, certain means must be adopted to prevent contamination and infection in wounds.

What these means are, the reader is, no doubt, fully familiar with, and as it is not my purpose to discuss them here, I will proceed with the various tables by means of which I hope to show conclusively the truth of what is favorably asserted for the antiseptic treatment of all wounds:

TABLE I.—SHOWING THE COMPARATIVE MORTALITY OF MAJOR AMPUTATIONS, IN REFERENCE TO CAUSE AND PERIOD OF OPERATION, BOTH BEFORE AND DURING THE TIME OF ASEPTICISM.

Cause and Period.	Pre-aseptic Period.			Aseptic Period.			Mortality per cent. in favor of asepticism over and above pre-aseptic period.
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	
Primary ² . .	2540	901	35.47	470	114	24.26	11.21
Secondary ³ . .	777	390	50.19	180	62	34.44	15.75
Disease ⁴ . . .	2602	618	23.75	1227	197	16.06	7.69
Grand total . .	5919	1909	32.25	1877	373	19.87	12.38

In the above table several facts are shown:

(a) That the mortality of amputations done under *aseptic precautions* is reduced as much as 15.75 per cent. in the highest instance, and in the lowest case 7.69 per cent.; the percentage in favor of the antiseptic method in the aggregate of cases being 12.38. Surely a saving of life worthy to commend in the highest terms the means used in attaining it.

It may be claimed by some, that as the above results are procured by a comparison of cases operated upon in different hospitals, under different surroundings—hygienic and otherwise—that they are not conclusive enough. Table III. is prepared so as to overcome that objection.

TABLE II.—SHOWING THE COMPARATIVE MORTALITY OF MAJOR AMPUTATIONS FOR INJURIES AND FOR DISEASE.

	Pre-aseptic Period.			Aseptic Period.			Mortality per cent. in favor of asepticism over and above pre-aseptic period.
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	
Injury . . .	3317	1291	38.92	650	176	27.08	11.84
Disease . . .	2602	618	23.75	1227	197	16.06	7.69

¹ Thomas G. Morton, M.D.: Clinical Lectures delivered at the Pennsylvania Hospital, October 2 and 23, 1886. Reprinted from the Philadelphia Medical Times.

² Amputated within twenty-four hours subsequent to accident.

³ Amputated after the primary period.

⁴ Amputated for either deformity or disease. The primary and secondary amputations were done for injuries.

(b) That the mortality in amputation for disease is less than that for injury.¹ (Shown to better advantage by Table II.)

(c) That primary amputations are more successful than those done later; in the *pre-aseptic period* the death-rate being nearly one in three in the early operations, while that of the late operations was about one in two. In the *aseptic period* the death-rate is less than one in four in the early operations, and more than one in three in the late or secondary operations.

TABLE III.—SHOWING THE COMPARATIVE MORTALITY OF AMPUTATIONS, BOTH BEFORE AND DURING THE ASEPTIC PERIOD, IN THE SAME HOSPITALS.

Hospital.	Pre-aseptic Period.			Aseptic Period.			Mortality per cent. in favor of asepticism over and above pre-aseptic period.
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	
S. B. H. ² . . .	358	74	20.67	629	108	17.17	3.50
G. H. ³ . . .	735	253	34.42	783	186	23.75	10.67
S. T. H. ⁴ . . .	181	61	33.70	465	79	16.99	16.71
Grand total	1274	388	30.46	1877	373	19.87	10.59

In this table the lowest reduction in favor of the antiseptic treatment is 3.50 per cent.; the highest is 16.71 per cent. What could be more satisfactory?

It is hardly possible for one to disprove the conclusions deduced from this table of facts.

Listerism, as it was, is not the modern method of antiseptic surgery. Some of its early advocates carried the matter to the extreme, we readily admit, but now that the truth has been learned, and aseptic surgery has stood the test of time and experience, the surgeon who does not carry out his treatment accordingly is hardly giving his patients that security against infection, disease, and even death, which modern science has shown it to lessen in a great measure in all operations.

In Table IV., in which the mortality per cent. is shown in an even more favorable light than in the tables previously quoted, notice particularly the saving of life in amputations done upon the leg and forearm.

The fact that the gravity of amputation increases as the trunk is approached—as was called attention to by Dr. John Ashhurst, Jr.⁵—is shown in the following table. Dr. D. Hayes Agnew⁶ gives a comparative

¹ Ashhurst: Int. Encyclopædia of Surgery, vol. i. (revised edition) p. 632.

² St. Bartholomew's Hospital. ³ Guy's Hospital. ⁴ St. Thomas's Hospital.

⁵ Principles and Practice of Surgery, 4th ed., p. 112.

⁶ Agnew's Surgery, 1881, vol. ii. p. 331.

table of the major amputations in American, London, and Paris hospitals, which is also interesting as showing the same relative condition in all three places. The aggregate mortality of amputations in America is recorded therein as 28.81 per cent., and in Paris as 56.54 per cent.

TABLE IV.—SHOWING THE MORTALITY OF AMPUTATIONS IN THE DIFFERENT PARTS OF THE BODY, BOTH BEFORE AND DURING THE ASEPTIC PERIOD.

	Pre-aseptic Period.			Aseptic Period.			Mortality per cent. in favor of asepticism over and above pre-aseptic period.
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	
Forearm . . .	113	15	13.28	172	5	2.91	10.37
Arm	173	53	30.63	220	46	20.91	9.72
Leg	345	136	39.42	698	108	15.47	23.95
Thigh. . . .	535	224	41.87	787	214	27.19	14.68
Total . . .	1166	428	36.71	1877	373	19.87	16.84

It appears, then, from this table, that in the *pre-aseptic period* the mortality of amputations of the *forearm* was about one in eight, that of the *arm* over one in three, of the *leg* not quite one in three, and in the *thigh* about two in five; and that in the *aseptic period* it was less than one in thirty-five in the *forearm*, less than one in five in the *arm*, less than one in seven in the *leg*, and about one in four in the *thigh*.

It is known that the danger of amputation increases with the age of the individual operated upon—a point brought out in the investigations of Dr. George W. Norris.¹ It will be well, then, to compare pre-aseptic statistics of amputation, arranged according to age, with the statistics of the same institutions during the present aseptic period.

TABLE V.—SHOWING THE RESULTS OF PRE-ASEPTIC AMPUTATIONS AT GUY'S AND ST. BARTHOLOMEW'S HOSPITALS, ACCORDING TO AGE.

Age.	Guy's Hospital. ²				St. Bartholomew's Hospital. ³			
	Recovered	Died	Total.	Mortality per cent	Recovered	Died.	Total.	Mortality per cent.
19 and under .	121	33	154	21.4	58	3	61	4.9
From 20 to 40 .	145	78	223	34.9	72	20	92	21.7
40 and over . .	95	87	182	47.8	44	30	74	40.1
Total . . .	361	198	559	35.4	174	53	227	23.3

¹ AMERICAN JOURNAL OF THE MEDICAL SCIENCES, August, 1888.

² Analyzed by Mr. Golding-Bird, Guy's Hospital Reports, third series, vol. xxi. p. 253.

³ Ashhurst: Encyclopædia of Surgery, vol. i. (revised ed.) p. 626.

TABLE VI.—SHOWING THE RESULTS OF ASEPTIC AMPUTATIONS AT GUY'S AND ST. BARTHOLOMEW'S HOSPITALS, ACCORDING TO AGE.¹

Age.	Guy's Hospital.				St. Bartholomew's Hospital.			
	Recovered	Died.	Total.	Mortality per cent.	Recovered	Died.	Total.	Mortality per cent.
19 and under .	214	54	318	16.9	143	11	154	7.2 ²
From 20 to 40 .	180	44	224	19.7	256	11	267	4.1
40 and over . .	153	88	241	36.5	198	76	274	27.9
Total . . .	597	186	783	23.8	597	98	695	14.1

TABLE VII.—SHOWING THE DIMINUTION OF MORTALITY OF AMPUTATIONS, DURING THE ASEPTIC PERIOD, IN GUY'S AND ST. BARTHOLOMEW'S HOSPITALS, ACCORDING TO AGE.

Age.	Diminished mortality during aseptic period.
19 and under	2.9 per cent.
From 20 to 40	19.9 " "
40 and over	13.9 " "
Total	19.4 per cent.

The figures and tables herein given show fairly and truthfully, so far as statistics can, what has been the saving of life owing to the adoption of the aseptic or Listerian treatment of wounds. It may be possible that this is not the only method by which wounds may be successfully treated, but be that as it may, many operations are now undertaken that we dared not formerly perform, and with a far greater prospect of success than with any other known mode of treatment.

If Listerism has done nothing else, it has at least secured an amount of attention that was never paid before, to cleanliness; but it has done more, in that it has aimed at not mere prevention or removal of septic material, but at the destruction of it, by producing in the neighborhood of all wounds an aseptic atmosphere.

Previous to the adoption of aseptic or Listerian treatment of wounds, a mortality of 31.9 per cent. was recorded (Tables V. and VI.) in two of the main London hospitals. Subsequent to that time, under aseptic pre-

¹Impossible to compile statistics from the annual reports of St. Thomas's Hospital for this table or Table I., hence their omission.

² Mortality was increased here owing to some of these cases being very young children, under five years of age.

cautions, the death-rate has been decreased (as shown in the same tables) to 12.5 per cent., a saving of life of nearly 20 per cent. Granting that these figures are faulty and misleading in conclusions drawn from them, may we not, by deducting 50 per cent. for such supposed errors in the present case, conclude that the remainder is a fair and just figure upon which to base an opinion as to the merits or demerits of the question of the value of antiseptic surgery. It certainly appears so, for what could be more reasonable? If then ten per cent. or even five per cent. of life is saved by the aseptic treatment of all amputations, its adoption should be universal, both in hospitals and private practice.

41 NORTH TWELFTH ST.

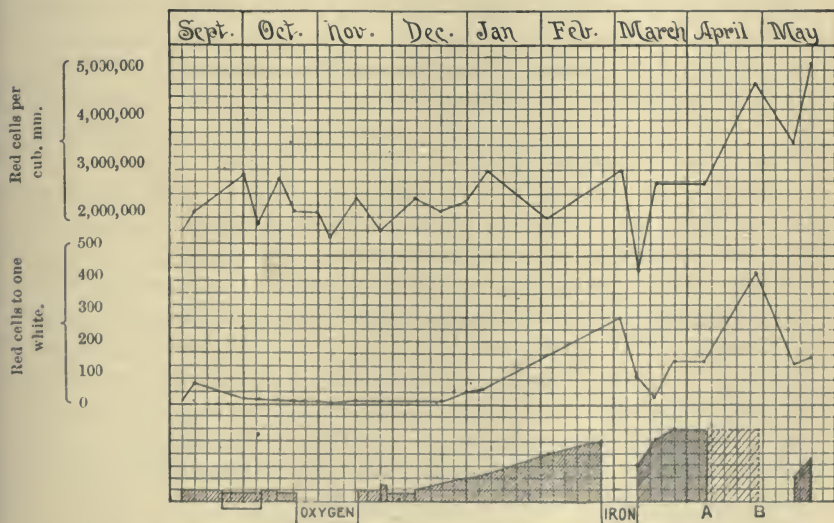
NOTE ON THE TREATMENT OF LEUKÆMIA.

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F. O., male, present age thirty-four, first noticed that he was getting large about the waist in the winter of 1886-87; from that date he became feebler, was troubled with frequent and sometimes severe nose-bleed, exhausting night-sweats, cough, some fever, and marked dyspnœa. There has been no priapism.

I saw him in the early part of September, 1888. His waist measured between forty and forty-one inches. The spleen extended down about three inches beyond the middle line, very nearly reaching Poupart's ligament. It seemed to have sagged a little, so that the upper right border, as determined by percussion at the back, had moved a little further than



normal from the middle line. The spleen was hard, its border notched, and it was firmly fixed in position. The entire abdomen was hard, but no definite proof of ascites could be detected. There was well-marked oedema of the legs. The liver was not much enlarged. There were no signs of pulmonary tuberculosis.

The white blood-cells were to the red as one to twenty, and the red were 2,400,000 per cubic millimetre.

The variations of the blood-cells under treatment are exhibited in the chart; they ran in the earlier weeks of treatment as low as 1 to 10.

The upper line represents the absolute number of red cells per cubic millimetre.

The middle line gives the number of red cells for one white.

The lower line indicates the treatment. Above the base-line arsenic is represented, and one (vertical) space means five drops of Fowler's solution three times daily. There were a few unrepresented intermissions of arsenic for forty-eight hours, it being resumed at the last dose. The spaces below the line indicate drugs other than arsenic; they are in general unimportant—a little iron, strychnine, or oxide of zinc. For a period of about a month in October and November, however, he took oxygen. This was bought under the name of "pure oxygen for medical purposes," but was really found to be diluted with nitrogen so that the oxygen constituted only a trifle over two-thirds of the mixture. (The analysis was very kindly made for me by Prof. H. E. Smith, of the Medical Department of Yale University.) Of this oxygen mixture the patient took twenty-eight quarts once daily, with very fair but not absolute regularity. During the time marked "Iron," in February and March, the dose was simply 15 gtt. tr. ferri chlorid. t. i. d.

The more lightly shaded arsenic space in April is intended to indicate the fact that while the patient was ordered 30 gtt. Fowler's sol. t. i. d., he in reality was remiss in taking his medicine, stating that he felt the greatest repugnance to it. There were no indications of intoxication. He seemed to have taken the dose about half as often as prescribed. The observations were made at 8 P.M. after a supper at 6 P.M.

Now it will be observed that no effect was produced on the leucocytosis by either the oxygen or the small doses of arsenic. When the latter was increased the leucocyte line began very perceptibly to rise and reached the proportion of 1 to 350 in March. After a substitution of iron for arsenic for a little over two weeks there was a marked increase of leucocytes. The reinstitution of the arsenic in doses rapidly rising to 30 drops t. i. d. carried the leucocyte line up to a ratio of 1 to 530. The line dropped again when the arsenic was stopped at the end of April, and rose a third time on its resumption. The arsenic effects seem to be sluggish—*i. e.*, the rises and falls of the leucocyte line seem to come a little while after the changes in the arsenic line.

The red-cell-per-millimetre line observes the change of the other lines,

and, if anything, seems to respond to the arsenic a little more quickly than the leucocyte line.

The general condition of the patient at present is very good. His symptoms have throughout corresponded pretty well with the blood improvement. His girth is thirty-four or thirty-five inches in place of forty or forty-one. The lower right border of the spleen has retreated to the middle line, or a trifle to the left of it, below the umbilicus. The upper left border is above the costal border, but still further from the middle line than at first; so that the reduction in size of the spleen has been very considerable, involving, I should say, a shortening of its larger diameter four or five inches. It is now freely movable and the abdomen is soft. He has had no epistaxis of any extent since Christmas; he has no fever, no night-sweats, no dyspnoea or cough. His appetite is excellent; he looks and feels very well. His weight, notwithstanding the diminution of girth, has increased several pounds.

ON A CASE OF SIMPLE IDIOPATHIC MUSCULAR ATROPHY, INVOLVING THE FACE AND THE SCAPULO- HUMERAL MUSCLES.

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In the classification of primary myopathies, the difficulties have been greatly increased by the description of forms depending upon the situation of the atrophy. Varieties of the same disease have been described as separate maladies, and from the inevitable confusion we have scarcely escaped.

Erb has simplified matters very much by grouping all the forms under one designation—*dystrophia muscularis progressiva*—of which two chief types are recognized:

(1) With primary hypertrophy, the pseudo-hypertrophic muscular paralysis.

(2) With primary atrophy.

As cases of pseudo-hypertrophic paralysis occur in which atrophy and hypertrophy exist in the same muscle, or wasting occurs in one group and enlargement in another, or atrophy in one group precedes for months the development of hypertrophy in another, it is not surprising that these two forms are regarded by many as identical. Gowers, however, calls attention to the fact that, when cases of atrophy occur in families, they never present the features of pseudo-hypertrophic disease.

It is in the cases with primary muscular atrophy that the greatest confusion exists in classification, and the following forms have been recognized and described:

(1) Erb's juvenile form.

(2) The facio-scapulo-humeral form of Duchenne, and of Landouzy and Déjérine.

(3) The hereditary form of Leyden.

(4) The peroneal type of Charcot, Marie, and Tooth.

Gowers has, it seems to me, followed the sensible plan in disregarding all of these subdivisions, and describing the cases under the designation "simple idiopathic muscular atrophy."¹

CASE.—Sebastian B., aged fifteen, sent to the University Hospital November, 1888. Good family history, both parents living; mother lame, cause unknown. Has one brother, aged twenty, and a second aged thirteen. Has three sisters, aged seventeen, eight, and three, respectively, all well. Two brothers are dead, cause unknown.

Personal history.—He has had measles, smallpox, and possibly scarlet fever. For several years he has had attacks of abdominal pain. He has also had earache. Until five years ago he was well and strong, and played about like other boys. From this time he had gradually been getting weak in the arms, and for between three and four years he has not been able to whistle. All of this time he has been in fair health, but has had increasing difficulty in dressing himself, and in getting from the recumbent to the erect posture.

Present condition.—Station erect, back not curved, gait normal.

Face smooth, immobile, and expressionless—the so-called *facies myopathique*; naso-labial fold absent; lips project, but the prominence is in

FIG. 1.



Appearance of face.

part owing to the teeth. The eyes are large, no exophthalmos; movement of the eyeballs normal. On attempting to close the eyes the pal-

¹ A full discussion of the relation of these forms to each other has recently been published by Dr. B. Sachs. New York Med. Journal, Dec. 15, 1888.

pebral slit remains open about two mm. in breadth. Most forcible contraction of the orbicular muscles fails completely to cover the eyes. (See Fig. 1.) He is unable to frown or to pucker his eyebrows. The forehead can be wrinkled. He has fair power of movement of lips, and he can pucker them in the movements to whistle, but cannot make the sound. When he laughs he opens the lips vertically, but the angles of the mouth are not drawn out. The zygomatics do not appear to act. The dilators of the nose move slightly on deep inspiration.

Neck. Thyroid is a little enlarged. The clavicular portion of the sterno-cleido muscle is wasted, the upper part is better marked than at the lower. The scaleni seem well developed,

Thorax. Long, and depressed in antero-lateral regions. The pectorals are extremely wasted, scarcely a portion of the muscle can be felt. The subclavicular regions are much flattened. The scapulæ are winged and stand out prominently. Trapezius is wasted in its lower portion. The superior fold on either side is still well marked. The neck does not look so thin from behind. The latissimi dorsi and serrati muscles are much wasted. The interscapular regions are flattened as if the rhomboids were involved. The supra- and infra-spinati are thin, and the scapular fossæ show with great distinctness.

The *upper extremities* are extremely wasted, contrasting strongly with the legs. The movements are considerably impaired. The right arm can be lifted above the head; the left only to the level of the ear. At the most prominent part of the biceps the circumference is only five inches. The bony prominences of the shoulder-joints stand out almost free from muscular covering. The acromion and coracoid processes and the greater and lesser tuberosities can be plainly seen. The deltoids are extremely wasted. When the arm is everted there is a small portion of the muscle, just above its insertion, which stands out with great prominence. The biceps, triceps, and brachialis anticus on both sides are much wasted. In making strong flexion of the arm there is still a slight belly on the biceps. At the outer margin of the upper part of the right biceps there is an oval, firm portion. Proportionally more muscle remains on the triceps. The forearm measures at the middle five and a quarter inches. The supinators have lost their prominence. The flexors remain in considerable bulk. There is a fair volume of muscle in the extensor surface. Pronation and supination are perfect. The hands are thin; no special wasting of the thenar or hypo-thenar eminences, or of the interosseous spaces. He cannot make a fist satisfactorily with either hand. Movements of the fingers are slow but perfect. There are little warts on the hands, several on the palmar surfaces and terminal phalanges.

Fig. 2 gives a fair representation of the distribution of the atrophy.

Lower extremities. The glutei do not appear wasted. The thighs at the middle measure eleven and a half inches. The region of the internal vasti seem somewhat wasted. The calves measure nine and a half inches. No wasting of the leg muscles. Moves the feet and toes perfectly.

There are no fibrillary tremors. Sensation everywhere perfect. Knee-jerk extremely feeble.

Dr. Willets reported that there was no reaction of degeneration in any of the wasted muscles.

The patient can still dress himself, but with difficulty. When recum-

bent, he cannot raise himself upright. He gets out of bed by rolling the feet and legs out first, then turning on his face and sliding out.

FIG. 2.



Showing muscular atrophy.

Duchenne first described a form of muscular atrophy beginning in infancy and attacking the muscles of the face. Landouzy and D  j  rine (*Revue de M  decine*, 1885) have studied this form with great care, and regard it as different from the other forms of juvenile hereditary myopathies. In their first communication they described two families, and reported a post-mortem which showed the spinal cord to be normal. In a second communication (*Revue de M  decine*, December, 1886) they described six cases, and again expressed doubts as to the identity of this with Erb's juvenile form, and also denied that it has any connection with pseudo-hypertrophic muscular paralysis. Marie and Guinon (*Revue de M  decine*, 1885) describe four cases in two families, in one instance beginning at the age of thirty. They hold that this form is

not essentially different from the other varieties of the primary myopathies. Remak (*Neurologisches Centralblatt*, 1884) describes the case of a man, aged thirty-two, in whom the affection began in childhood; there were other members of the family also affected. He, too, seems to regard it as a variety of the juvenile form of progressive muscular atrophy. Kreske (*Neurologisches Centralblatt*, 1886) reports the case of a boy of ten, affected since his fourth year. There were no other members of the family affected. Singer (*Zeitschrift für Heilkunde*, Bd. 8; *Neurologisches Centralblatt*, 1887) reports the case of a man, aged thirty-four, who for two years had difficulty in whistling; the muscles of the shoulder and of the face were also affected. He, also, regards this form as only a variety, not a separate affection. Spillman and Haushalter (*Revue de Médecine*, 1888), and Sperling (*Neurologisches Centralblatt*, 1889) also report cases.

Altogether, there are recorded about twenty-five of this variety of idiopathic muscular atrophy. In the great majority of cases, the disease has begun in childhood or in youth. One case of Landouzy and Dégérine began at the fortieth year in the shoulder and arm; four years later it affected the face. This, with the case of Singer's, which began at thirty-two years, and the case of Marie and Guinon, which began at thirty years, shows that the onset of the affection may be delayed until adult life. The cases all seem to conform to the characteristics of simple idiopathic muscular atrophy, and I see no reason why we should classify this variety as a separate disorder.

The cases of this kind, and of Erb's juvenile form, do not appear to be nearly so frequent in this country as the pseudo-hypertrophic variety, which is not at all an uncommon disease. With the exception of the case of James Stewart's report (*Canada Lancet*, September, 1884) no cases of Erb's juvenile form have been reported, and none, so far as I know, of the so-called Landouzy-Dégérine type.

A FATAL CASE OF VARICELLA GANGRÆNOSA.

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AND OF THE PRESBYTERIAN HOSPITAL, N. Y. (OUTDOOR DEPARTMENT).

THE following case of this rare modification of the varicellar lesion I have had the opportunity of observing in the practice of Dr. C. W. Büchler:

On November 18, 1888, E. A., female, aged four years, was attacked by varicella, a number of the vesicles became gangrenous, leading to the death of the child on November 27, 1888, with symptoms of septicæmia.

Early in November, a sister of the patient, aged seven years, and a brother of six, were attacked by varicella, which, with moderately high fever, ran a mild course, with the ordinary duration of the disease. On the 17th of November a third child became affected, and on the following day the case under consideration was first seen.

In this case the attack was ushered in by a temperature of 104° , and a pulse of 120. On the following day a crop of vesicles (without prior papulation) appeared upon the abdomen, chest, back, and extremities. While the majority of the efflorescences took the usual course of the varicellar vesicle, and then desiccated, about eighteen or twenty, especially some of those on the chest, back, and buttocks, were partially filled with pus of a greenish-yellow color, and presented a flaccid appearance. Each lesion was surrounded by a broad phlegmonous areola.

The vesicles, thus modified, soon assumed a gangrenous appearance, and on the fourth day of the eruption were converted into deep ulcers, covered by a blackish-green detritus, some attaining the size of a ten-cent piece, and others that of a quarter of a dollar. They were so offensive as not to be controlled by antiseptics, and so painful that anodyne dressings were without effect.

All of these ulcers were sharply defined, as if punched out, and penetrated the entire thickness of the cutis and subcutaneous tissue, exposing the fasciæ. The largest of them were located upon the abdomen and back; but one, especially large and deep, was situated over the mastoid process of the left side, close to the insertion of the cartilage of the ear, which became involved in the destructive process.

Notwithstanding active antipyresis, tonic treatment, and the most scrupulous antiseptic precautions, the temperature could not be reduced lower than 103° . The pulse became feeble and rapid, the thirst was unquenchable. During the last two days of the disease, a violent attack of diarrhoea with very offensive stools supervened, and on November 27th coma terminated the condition.

From the paucity of accounts, which, as far as I am aware, are confined solely to the British journals, one must infer that gangrenescence of the varicellar lesion is not frequently encountered. Hutchinson,¹ I believe, was the first to direct attention to this condition. At a meeting of the Royal Medico-Chirurgical Society, October 25, 1881, he stated that for more than ten years he had recognized a gangrenous form of varicella, which was occasionally accompanied by a purulent iritis; in some instances the disease proved fatal, while in the majority of cases recovery, with deep scars in some and great damage to the eyes in others, resulted. In the worst cases the disease involved the entire thickness of the skin, and left an abrupt, punched-out ulcer. He also quoted from Whitely Stokes, of Dublin, who, in 1807, described an affection prevailing in Ireland under the designations "white blisters," the "eating hives," and the "burnt hole," which Hutchinson regarded as identical with the affection under consideration.

In proof that the affection is no other than a modified varicella, Hutch-

¹ Lancet, October 29, 1881, p. 751.

inson points to the fact of the simultaneous occurrence of ordinary varicella in other members of the same family. He also mentions having seen similar cases in the practice of Drs. Barlow and David Lees, and refers to wax casts in Guy's Hospital, labelled "*rupia escharotica*," which he unhesitatingly regarded as examples of gangrenous varicella. Concerning the etiology of the affection, Hutchinson claims that this modified lesion of varicella usually occurred in previously healthy children.

At the same meeting, Dr. Barlow¹ stated that he had notes of fifteen cases of varicella gangrænosa, which began with a vesicle, not a papule, without an areola; the vesicles collapsed, and a punched-out or trephined ulcer, as he calls it, ensued. The progress is so rapid that, in a day or two, the ulceration may extend through the entire thickness of the skin. In no instance were the children thus affected healthy; frequently there was lung disease, and in six post-mortem examinations tubercle was present.

Drewitt² also reported a case in which gangrenous patches appeared upon the inner surface of the thigh and on the labia; other children of the same family were simply affected by ordinary varicella.

In a fatal case reported by Abercrombie,³ that of an ill-nourished male baby, aged fourteen months, there was found, on post-mortem examination, some pneumonia of both lungs, with recent pleuritis of the right side. There was also a small ulcer above the ileo-cæcal valve. Besides a number of smaller caseous mesenteric glands, one opposite the cæcum attained the size of a marble. Here also it is mentioned that a remaining child was attacked by varicella, which, as the author does not indicate otherwise, presumably ran a normal course. In Haward's⁴ case, also that of an ill-nourished child, aged one year, which terminated unfavorably, the temperature, as in our patient, reached 104°; there was dulness on percussion over the base of the right lung. The immediate cause of death was pyæmia. The necropsy revealed the presence of small abscesses in each lung; on the surface of the left pleura there was recent lymph, and two ounces of pus in the pleural cavity.

In a fatal case, recorded by Payne,⁵ acute miliary tuberculosis was found on autopsy. This coincidence, the author states, might be entirely accidental, but possibly it might be an important factor in the occurrence of the eruption.

Bowly⁶ and Radcliffe Crocker⁷ have also met with examples of the

¹ Lancet, October 29, 1881, p. 751.

² Ibid.

³ A Case of Varicella Gangrænosa, by John Abercrombie, M.D.: Transactions of the Pathological Society of London, vol. xxxi. p. 333.

⁴ A Case of Gangrenous Varicella, by Warrington Haward: British Med. Journ., 1883, p. 904.

⁵ Lancet, May 30, 1885, p. 987.

⁶ Ibid.

⁷ Ibid.

affection. Bowly's case was apparently cured, but the day subsequent to its discharge it died of convulsions.

Besides several cases terminating in recovery, Crocker has observed two fatal cases, in one of which there was a strong history of tuberculosis. According to the latter author, the gangrenous condition need not necessarily arise from the varicellar vesicles, but may develop independently of it in the skin not the seat of the eruption. This mode of origin of the gangrenous patches rests solely with Crocker, and lacks confirmation from other sources. Moreover, he states that gangrene may set in at the onset of the disease, or during the subsidence of the varicellar eruption.

In reviewing the histories of the cases recorded, we find lowered vitality of the patient almost universally emphasized, and in many there was a distinct history of tuberculosis, confirmed by the presence of tubercles on autopsy. Hutchinson, however, as has already been stated, denies the influence of a constitutional taint, and is of the opinion that the gangrenescence of the varicellar lesion is simply due to idiosyncrasy of the patient.

Concerning the etiology of our case, it should be mentioned that the child was of healthy family; there was no history nor any manifestation of syphilis, tuberculosis, or scrofula in the parents nor in the patient. The family had but recently returned to New York from New Jersey, where they had lived for about a year in a malarious district, and where all of them were attacked by various forms of malaria, but especially so our patient, whose health was thereby considerably undermined.

The main cause for the pernicious course of the disease, however, must be sought in the surroundings of the patient. In the rear of a butcher shop, separated from the latter only by a thin board partition, was the bed-room, where the child constantly sojourned. Dark, scarcely admitting a ray of daylight, necessitating the continuous burning of gas, ill-ventilated and damp, it furnished all the conditions favorable for the generation of pathogenic microorganisms. And to this, rather than to any constitutional taint, must the gangrenescence of the lesion be attributed. It is but reasonable to infer that we have to deal here with a twofold infection—that of the varicellar virus with that of septic microbes superadded, though, unfortunately, the bacteriological proof is wanting.

REVIEWS.

A SYSTEM OF OBSTETRICS BY AMERICAN AUTHORS. Edited by BARTON COOKE HIRST, M.D. Volume II. Illustrated with two hundred and twenty-one engravings on wood. 8vo., pp. 854. Philadelphia: Lea Brothers & Co., 1889.

THIS volume concludes the series of treatises contained in four volumes and known as the "American System of Gynecology and Obstetrics." The opening contribution, by Dr. Theophilus Parvin, is upon "Diseases and Accidents of Labor." It is to be regretted that in an encyclopædic work the author did not go into the etiology of "tears of the neck of the uterus," as he terms it, from the purely obstetrical standpoint. In the gynecological volume Dr. Bache Emmet has given it an ample surgical exposition, but the subject of laceration of the cervix has two aspects. The surgical gynecologist is rarely an obstetrician, as from the arbitrary nature of his engagements it is nearly impossible for him to respond to cases in this department of practice. Conflict of opinion has thus come between men who ought to deal intelligently with common facts. We constantly hear worthy practitioners held responsible for lacerations of the vaginal portion. Is faulty handling of parturition responsible for this accident, or is it the result of certain physical conditions or error in the physical forces engaged in the act? This is the question that authorities in obstetrics have to answer, and it is a subject of regret that one so competent as Dr. Parvin to give an authoritative opinion has neglected the present opportunity. Believing, as we do, that it is the result of conditions other than manual or instrumental interference in the conduct of labor, we are daily seeing the need of more careful study of the subject. Strange to say, what attention has been given to it was from the gynecological aspect of the injury, and not from the obstetrical. Of course, a certain, but very small, proportion of these cases is due to necessary interference in the natural mechanism of labor, but these are excluded. But what are we to say to the woman who believes that her injury is due to carelessness or ignorance on the part of her physician, and who makes a reasonable request for information as to what obstetricians may have to say upon the subject? Already the reviewer has been upon the witness-stand in one case of this nature, and the remarkable silence of obstetrical writers upon this subject was one of the grounds upon which the prosecution based their case. Possibly in the next edition of his own book Dr. Parvin may see his way to an authoritative expression of opinion.

Injuries of the Perineum follow, and upon this time-honored subject the author cannot be criticised for want of attention. To the young practitioner the author does not give much encouragement in prophylactic treatment. Inversion of the Uterus calls for a short but clear

statement. Hemorrhage in placenta prævia is next studied, and those who adhere to the classic tampon may have the courage to say so openly henceforth. Injuries to the Child during Birth is one of the most lengthy sections of Dr. Parvin's contribution. Sudden Death during or following Labor, and Disease of the Mother with Reference to Labor, conclude the section.

"The Forceps and Embryotomy," by Dr. E. P. Davis, is a well-illustrated paper. Concerning the application of the forceps, the author calls attention to a fact worthy of notice here. The French, he says, admit rotation of the head with the forceps in high application, the Germans do not apply the forceps until rotation has occurred, while the English and Americans apply the forceps to the sides of the pelvis. If the latter method is the operator's custom, the author's advice is to continue the practice. This reminds us of the noteworthy paper of Dr. Clark, of Oswego. Here the systematic writers are taken to task for directing a method of application that is never carried out at the bedside. Forceps are applied just as traction is made, with reference to the maternal parts and without any regard to the part of the child that is in advance in the birth-passage. Since the true use of the forceps as a traction, and not as a restitution, instrument has become more clearly defined, the use of the instrument has greatly increased, to the infinite benefit of women. Vesico-vaginal fistula from impacted head, from being a very common accident, is now very rare. The clinical use of the forceps is entirely a different matter from the didactic theory of its application. This is quite a modern notion, and has followed largely from the increased attention attracted to the subject by the labors of Tarnier and others, and now depends on the simple theory that both the instrument and its application must favor traction, and without regard to the presenting part.

Embryotomy forms the conclusion of this section. Whether the future will be one of Cæsarean section or embryotomy will depend largely on a consensus of opinion. The methods have been largely improved, antisepsis has become the obstetrical law of the land, and all that is needed to settle a question of great practical importance like this is a general consent in opinion. Our author leans toward what he calls the "conservative procedure"—that is, the section. For the performance of embryotomy a knowledge and observance of antisepsis are requisite equal to those demanded for Cæsarean section. The technical skill needed to perform a difficult embryotomy is fully as great, if not greater, than that which the Cæsarean operation calls into play, while the instruments employed for the destructive operation are more complicated. That the outlook for the Cæsarean operation in the United States will improve there can be no doubt.

"Premature Induction of Labor," by Dr. Cameron, of Montreal, and a lengthy contribution on "Version," by the same author, follow. Concerning what we may term the ethnology of version and the forceps, Cameron makes the interesting comparison that in Germany turning is the favorite operation, that in France the axis-traction forceps has greatly displaced manipulation, and as pelvic deformity is comparatively rare in England and America, hence, except among emigrant population version is rarely practised. Among Americans impediments to the exit of the child are rarely at the brim, and are generally found at the outlet, which has caused the forceps to be so often resorted to that "America

has been aptly styled the home of the low forceps operation." Cameron makes one statement of singular ethnological importance if true. "Placenta prævia is very common in Central Europe, and is comparatively infrequent on this continent."

Dr. Robert P. Harris writes the section upon the "Cæsarean Operation, Symphysiotomy, Laparo-elytrotomy, and Laparo-cystectomy." This contribution is very timely, and allows its author to go over the whole subject in a connected and systematic manner. It is needless to say that no one is as well equipped to do justice to this subject in America as the author. Space will not allow the attention that this carefully prepared paper deserves.

One of the most valuable sections of the volume is by Dr. Garrigues on "Puerperal Infection." At the outset, however, the author mars his work by what we fear is a constitutional failure—a stickling after terms; a desire to become so accurate that he becomes obscure. Thus, when he says that "septicaemia is too strong a term" for puerperal fever, is he not using language a little too strong for the subject—what to the minds of some modern bacterial obstetricians may be called obstetrical profanity? The author has done valuable and permanent work in this field and deserves the recognition that has been accorded him in the opportunity of writing this interesting contribution.

The author begins by the general pathology of puerperal infection, basing his etiology solidly on the theory that the invasion of the system is due to infection and not contagion. We have no time to refer to anything among the many matters of interest except the preventive treatment. In this age if we wish to anticipate the medicine of the future there is one thing better than pathology or treatment, and that is prevention. Since the first of October, 1883, the author has had ample experience in preventive measures. He treats them separately, first the hospital, the attendants, and lastly the patient. He says, "At the hour of writing it is just five years since I introduced the bichloride of mercury treatment in the Maternity Hospital. During that time it has been kept up without any change, and the results have been so satisfactory that I feel very little inclined to make any." Cautions are, however, expressed concerning the danger of poisoning from this agent, and the history of many cases given. The author in his own hospital experience has never had a fatal case of mercury poisoning. We believe that the solution recommended by him is too strong; 1 to 2000 is not safe in the hands of the general medical and nursing public. In the uterus and genitals we never have exceeded 1 to 3000, and the coagulating effect of this solution is excessive. A solution so strong as to produce rapid coagulation of albuminous fluids is liable to defeat the very purpose for which it is used, by covering the surface which it is desired to disinfect with a layer of insoluble coagulum. This is a very practical point and one of special importance in disinfection of the genital tract bathed in an excess of secretion, as it is just previous to parturition.

The experience of Garrigues coincides with that of all modern bacteriologists concerning the unreliable character of carbolic acid as a disinfectant. He is now experimenting with creolin. One advantage over bichloride is its slippery nature. He says: "I was most agreeably surprised in a case of turning to feel my hand slip through the vagina and cervix with a hitherto unknown facility after a vaginal douche of 2 per

cent. had been given." In this respect its effect is different from the bichloride solution, which has a strong astringent power. The author has been to considerable care to ascertain the rate of mortality of childbirth in large cities; abroad a per cent. of 1.12 is reached, and not much better in New York City, 1.06 per cent. "So much is sure," says the author, "that out of every one hundred women who give birth to a child in a private house in New York, one dies during or shortly after labor." In the performance of a natural function, that is too high a death-rate, and there is yet a margin for improvement. But what must it have been before the art was brought to its present refinement—when Semmelweis was not yet.

Dr. Garrigues also contributes the paper on "Inflammation of the Breasts and Allied Diseases connected with Childbirth."

Dr. Harold C. Ernst, in the "Etiology of Puerperal Fever," to have been rightly placed in the volume ought to have preceded Dr. Garrigues' article on puerperal infection. The former considers the subject from the laboratory standpoint, and the latter from the clinical. It is only necessary to give Dr. Ernst's definition to foreshadow his whole thesis. "It is allied to, and in fact is exactly similar to, any other of the septicæmic or pyæmic conditions . . . which arise more commonly in connection with surgical affections." Ernst has written a very valuable paper, and has collected all the available material upon the subject.

The editor, Dr. Hirst, takes up the subject of "Complications of the Puerperal State Independent of Septic Infection." This topic includes defective involution of the uterus, repair of the injuries of childbirth, puerperal hemorrhage, displacements of the uterus, hæmatoma, carcinoma of the corpus and cervix, fibroids, non-infectious fevers, pneumonia, pleurisy, the exanthemata, diseases of the urinary system, gonorrhœa, abnormalities of the milk secretion, and relaxation of the pelvic joints. A vast subject is well disposed of in one hundred and eighty one pages in a very practical manner.

Dr. Lloyd next takes up the subject of "Insanity and Diseases of the Nervous System in the Childbearing Woman." Puerperal Insanity is treated of in an elaborate monograph of forty-five pages, followed by the same amount of space given to the subject of Occasional Neuroses of Pregnancy.

Dr. J. Lewis Smith, of New York, takes up the subject of the "Management of the Diseases of the Newborn Infant," which supplements the article in Volume I. on the management of the newborn infant. It need not be said that the article is a masterpiece on the subject, and constitutes a volume in itself. No hand-book on obstetrics in any language contains anything like its equal on the subject in elaboration and practical details. A considerable amount of the matter is new in book form, and it is a misfortune to the reader that space prevents an analysis of the author's views.

Dr. Stephen Smith, of New York, contributes the section upon the "Surgical Diseases of Early Childhood," which is freely drawn from his work on the *Principles and Practice of Operative Surgery*. Surgical conditions of the umbilicus, supernumerary members, congenital union of the fingers and toes, cephal-hæmatoma, atresia of the mouth, harelip, fissured palate, absence of the tongue, macroglossia, and intestinal obstruction. Concerning laparotomy in the treatment of the latter, the

author evidently holds no high opinion. In some post-mortem examinations after the invaginations were very recent, which have come to the knowledge of the reviewer, adhesions were so firm that they could not be separated without tearing the intestine. We are convinced that it is not an operation which may be informally suggested after considerable time when all other measures have failed. Adhesions in invaginated intestines in a few hours would be too firm to be safely separated. Excision of the incarcerated portion would be the only safe method. In the case of an obstruction of a week's duration the writer declined to operate on these grounds. The rectum, the anus, hydrocephalus, cephalohydrocele, and spina bifida are well described and illustrated. Extroversion of the bladder and hernia are well illustrated with working drawings. Fractures and club-foot conclude the paper. These two last-named contributions are the best and latest expositions of the subject now before the profession, and will repay of themselves the somewhat large outlay in the work.

Dr. De Schweinitz treats of the "Congenital Anomalies of the Eye," and will be a great help to a proper understanding of the rare defects in the eyes of the newborn.

On the whole, the children have fared well in this volume of the American System, so that the whole field of normal and abnormal conditions of mother and child are presented to the reader in the most complete form of any work the reviewer has seen. The best writers have been carefully selected by the editor, names that alone afford a guarantee of careful and efficient work. None but a carping critic will find fault. There are many things put forward, possibly, by the men of vast experience and most self-reliant character who have contributed the more important sections, that many in the profession are not yet prepared to accept without argument. This must and ought to be the case in an exhaustive work that is in all its parts in line with the most advanced thought. In the English language there is no work on its various topics at all to be compared with it, and we may send it abroad without any fear that it will not be able to command the respect that it deserves.

In one matter alone the work as a whole is most complete and is destined to accomplish an unlimited measure of good in the future of American obstetrics; this is in childbed sanitation, or, as it is more commonly known, antiseptic midwifery. But if we are to educate the people to this gospel of cleanliness, we must give it a better name. Not only must it become an obstetrical law, but it ought to be the law of every intelligent woman. She must be taught that her chief danger in becoming a mother exists not in the act itself, dread it as she may, but in conditions that she, her nurse, and her doctor are perfectly able to prevent. That the people and the physicians who go into their homes are not yet educated up to the level of modern childbed sanitation is proven by the fact that domestic midwifery and hospital practice have changed places in their relation to mortality. More lying-in women in their homes die of dirt diseases, no matter how well surrounded, than their poor sisters in the lying-in wards of a hospital.

Antiseptic midwifery is not the rule in private practice even among men of good reputations. He may carry his corrosive tablets and wash his hands, a matter he may have neglected in years gone by, and now flatters himself that he occupies a foremost place in antiseptics, but he

ends here. He must be taught that this is not childbed sanitation. Again and again must the matter be brought to his understanding, and if in one generation a great revolution, partly of practice and partly of morals, is brought about, we may well be content. We believe that no recent work will contribute so much to this end as that which is here reviewed. Everywhere this practice is insisted on and taught in its most elaborate detail and will secure constant reference for a long time to come.

The publishers have mechanically turned out a work very nearly perfect. They have been liberal in the matter of illustrations—a subject that does not always run smooth between writers and the publishers in coöperative works, but here the authors have nothing to complain of. It is to be regretted that the general index at the conclusion of this volume is not as complete as it ought to be in a work of such encyclopædic character.

E. V. DE W.

THE OPERATIVE TREATMENT OF THE HYPERTROPHIED PROSTATE. By FRANCIS SEDGWICK WATSON, M.D. Pp. 167, with 34 photogravure plates. Boston: Cupples & Hurd, 1888.

IN this elegantly printed and illustrated work the author has collected anatomical and clinical data with the object "to supply, or, at least, to suggest, a rationale, based upon an analytical study of the actual conditions that are encountered, in the hope of placing this whole subject upon a rational basis that may serve as a ground for future operative action." He begins with a brief account of the various methods of operation, palliative and radical, heretofore employed, and follows it with a review of the indications for operation, and of the state of surgical opinion upon the subject at the present time. He then gives representations of actual size by photogravure of thirty specimens of enlarged prostate, brief clinical histories of 45 cases of prostatotomy or prosta-tectomy, tabulates the results, and closes with a few conclusions.

The study of the specimens shows that in 27 of the 30 cases median enlargement of the prostate formed the chief obstacle to urination, and that in 21 cases it "could have been successfully reached and incised, or partially or wholly removed, through the perineal route, by any one possessing an index finger which has a reaching length of three inches or more;" and that in 10 cases the bladder was so small that the supra-pubic operation would have failed. In 7 cases the distance of the median enlargement from the perineum was so great that a perineal operation would have failed.

The clinical data of radical operations show a mortality of 17 per cent., 8 deaths in 45 cases; and that 18 of the patients "were relieved, at any rate, for one year." "Of 19 palliative operations by drainage, 5 were relieved, at any rate, for one year."

He recommends: "In a given case (suitable for operation) open the membranous urethra, put in your finger and explore. Twice out of three times the operation can be completed by this route. In the other third of the cases, the long perineal distance, or the form of the median enlargement, will make the supra-pubic operation necessary."

In cases in which the patient's condition will not permit the radical operation, drainage through the perineum is ordinarily the best.

We note on page 162 a singular blemish in so well prepared and scholarly a work, *fenestrum* for *fenestra*.

L. A. S.

DIE MIKROORGANISMEN DER MUNDHÖHLE. DIE ÖRTLICHEN UND ALLGEMEINEN ERKRANKUNGEN, WELCHE DURCH DIESELBEN HERVORGERUFEN WERDEN. VON W. D. MILLER, Dr. med. et phil., Professor am zahnärztlichen Institute der Universität Berlin.

THE MICROÖRGANISMS OF THE MOUTH; THE LOCAL AND GENERAL DISEASES CAUSED BY THEM. By W. D. MILLER, M.D., Ph.D., Professor at the Dental Institute of the University of Berlin. 8vo., pp. xx., 305; 112 illustrations and 1 colored plate. Leipzig: Georg Thieme, 1889.

THE need has long been felt of a work presenting clearly our knowledge of the microorganisms of the mouth, and of their relations to diseases of the general system as well as to those of the oral cavity itself. Up to the present time the literature of the subject has been scattered through numerous periodicals in several languages. In the book before us Dr. Miller has collected the authenticated facts in this department of mycology, so many of which he himself contributed. But his book is far from being a mere compilation, for in it are to be found many new observations by its author, making it of unusual interest.

Being intended as much for the use of the dentist as for that of the physician, it has seemed wise to present at the beginning a short summary of our knowledge of the properties of microorganisms in general, and especially of their relationship to fermentation and disease. The mouth is then shown to afford all the conditions necessary for their growth. It is accordingly not to be wondered at that certain species should be almost constant inhabitants of it; indeed, a number of these have thus far shown themselves to be incapable of growth outside their usual abode. Beside the twenty-two varieties described by the author in the *Independent Practitioner*, in 1885, thirty new species have been cultivated, seven of which occur with sufficient frequency to warrant their description in the text. It is shown that these microorganisms of the mouth differ in no essential feature from other germs in their relations to putrefaction and fermentation; but that, in addition, a number of them have the power of converting albuminoid substances into peptone. The lactic acid fermentation was found to be the most frequent, the acetic and butyric acid fermentations being thought by the author not to take place under ordinary circumstances in the mouth.

On page 91 begins an extended discussion of the causes of caries of the teeth. The various theories which have been advanced in explanation of this process are reviewed and discarded as untenable. This can hardly excite surprise when it is known that most of them antedate the present century. By way of example, we may cite the theory prevalent in the time of Scribonius (43 A. D.), that dental caries is due to the presence of worms in the teeth, a theory which, by the way, has survived

to our day among the laity in China, and affords the Chinese dentist opportunity to exercise his propensity for juggling. He is said to conceal a number of small worms in a hollow tube, the end of which is introduced into the mouth of the patient. At the proper moment, when an opening into the aching tooth is supposed to have been made, the worms are skilfully ejected from the tube into the mouth of the sufferer, who immediately experiences much relief!

The recital of the author's own investigations into the causes of caries occupies nearly one hundred pages. It is impossible within the narrow compass of a review to give their details. Suffice it to say, that the theory which he educes at the end is based upon careful study of a very large number of cases, and is apparently most rational. He believes certain fermentations, chiefly the lactic acid, to be necessary precursors of any carious erosion of the teeth. These fermentations he has shown on a previous page to be of frequent occurrence in the mouth after the ingestion of carbohydrate foods. The acids thus generated form soluble compounds with the lime salts of the enamel, thus preparing the way for the lodgement of microorganisms on the roughened surface of the tooth. These continue the process. So far as the enamel is concerned, the process is essentially one of erosion of the surface, there being no penetration of the dense substance of the enamel by microorganisms, but in the case of the dentine it is different. Here the canaliculi are of sufficient calibre to admit of the entrance of microorganisms, and the process is carried on in the substance of the dentine as well as on its surface. Wherever the carious softening is progressing in the dentine, vast numbers of bacteria are found filling the canaliculi, many of which show the effects of their action in the irregularity and widening of their lumina, due, it is thought, to the digestion and absorption of the surrounding dentine. This process is not ascribed to any one species. Micrococci and bacilli of various species are found to take part in it, sometimes one predominating, sometimes another.

Artificial caries was produced by the author by allowing sound teeth to lie for a considerable time in mixtures of fermenting food and saliva. The caries thus produced presented all the appearances of that produced in the mouth. The caries occasionally found in the teeth of animals differs in no essential way from that in man, and is thought to be due to the same causes.

As predisposing conditions are mentioned softness of the enamel, deep fissures and cracks in it, irregularity of the teeth, retraction of the gums, etc.

Miller believes that his theory explains satisfactorily the low percentage of caries among races living upon a purely animal diet, since the fermentation thought by him so essential to the process, could not occur in the absence of carbohydrates in the food.

As prophylactic measures are recommended frequent cleansing of the teeth and mouth with antiseptic washes, among which Listerine is mentioned as agreeable and efficient.

The growing importance attributed to microorganisms in the etiology of disease makes the knowledge of their modes of entrance into the body of the greatest importance. The remaining third of the volume is devoted to the discussion of the various diseases of the mouth and general system dependent upon the introduction of pathogenic microorganisms from the mouth. Here, too, the original work of the author

is very apparent. After description of nine pathogenic species previously studied, four new ones are added as the outcome of his own investigations.

Among the diseases of the mouth, to the knowledge of which the author has contributed, may be mentioned "*pyorrhœa alveolaris*," a chronic suppurative inflammation of the periosteum of the tooth, with more or less intense inflammation of the gum and necrosis of the alveolar process. This he concludes to be due to the action of no one specific germ, but to that of any one of a number, acting upon a system much reduced by other disease.

Special stress is laid upon the importance of the mouth as a point of entrance for microorganisms in diseases of the pharynx, larynx, lungs, and alimentary tract, and it is pointed out that in operations about the mouth we have the conditions most conducive to infection of the blood and through it of the body in general. Thorough antisepsis is, consequently, most essential.

In conclusion, short mention is made of the various yeasts and moulds which have been found in the mouth by various observers.

The volume is well printed and abundantly illustrated. A copious bibliography and index add very materially to its usefulness. Its perusal is recommended to all those interested in following the growth of our rapidly increasing fund of information upon the relations of microorganisms to disease.

J. S. E.

TRANSACTIONS OF THE AMERICAN ORTHOPEDIC ASSOCIATION. Vol. I.
8vo., pp. 303. Boston, 1889.

THIS is an exceedingly interesting volume, containing the transactions of the first and second annual meetings of the American Orthopedic Association. The first twenty pages only are devoted to the first meeting, which was held chiefly for the purpose of organization. The articles are all by men recognized as specialists in this important branch of surgery, and for scientific interest and practical value represent a collection of monographs on orthopedic subjects that is unique. They are all so uniformly excellent that it is difficult to select those which would be of most interest to the general readers.

Dr. V. P. Gibney contributes a "Report on the Treatment of Club-foot by Means of the Thomas Wrench," in which he commends the simplicity of the instrument combined with tenotomy, and the subsequent use of ordinary shoes built higher on the outer side, and records twelve cases thus successfully treated.

Dr. E. H. Bradford also contributes a paper on the "Treatment of Clubfoot," to which is appended a table of one hundred and one cases, with a record of results and detailed notes of illustrated cases. The subject is handled in a masterful and impartial manner, is illustrated with numerous drawings, and there is a ring of sincerity that will please the general surgeon. In summarizing, he says: "In no branch of surgery can a cure be more confidently promised than in the treatment of club-foot, and in few surgical undertakings do half measures occasion greater annoyance" (p. 112).

Dr. Royal Whitman presents his "Observations on Seventy-five Cases of Flatfoot," in a paper of considerable value, and offers to the profession a brace of thin, tempered steel (to be worn inside the shoe), with which he has obtained the best results. It resembles somewhat the plantar spring of Dr. Roberts, but differs from it in being inelastic, and being made upon a special plaster-cast taken from the foot, placed at right angles to the leg and slightly flexed at the medio-tarsal joint. The brace (as he prefers to call it) is short, and is applied in such a manner as not to interfere with any of the natural movements of the foot.

Dr. De Forrest Willard's paper on "Osteotomy for Anterior Curvatures of the Leg," is able and instructive. It is, in fact, one of the best papers on the subject that has been written, and its author can speak authoritatively from a large experience. In speaking of the cases in which forcible fracture *versus* osteotomy should be employed, he considers that for children under three years the former (forcible manual fracture), and over three years the latter operation (osteotomy), is to be preferred, sclerosis or hardening having occurred in the latter cases. This is a good practical rule, but in doubtful cases recourse should be had to the bone drill to determine the exact density of the bone, and preferably the cog-wheel drill of Colin, of Paris.

The paper of R. W. Lovett, of Boston, "An Experimental Study of Fixation and Traction in the Treatment of Hip-disease, with the Description of a Splint," presents the results of a number of experiments to determine what degree of fixation occurs in using the traction hip-splints, especially the Taylor splint with a rigid waistband encircling the pelvis, and two perineal straps instead of one. The results showed "that traction in itself furnishes very incomplete fixation, and cannot be regarded as in itself a means of fixing a diseased hip-joint in the treatment of hip-disease; and that a Taylor hip-splint, with a rigid pelvic band and two perineal straps, furnishes much more complete fixation to the joint than the newer form of splint with only one perineal band." In conclusion, he exhibited a splint which was merely a modification of the English Thomas splint with an American Taylor splint, to be employed in certain bad cases as a means of furnishing fixation and traction while the patient goes about on crutches. This supplies an apparatus for which every surgeon who sees many of these cases has wished, and deserves a fair, unprejudiced trial.

A somewhat similar brace, combining the same principles, has been more recently recommended by Dr. A. M. Phelps, of New York.¹

This paper brought out the two principles underlying the modern treatment of chronic joint-disease—immobilization as opposed to extension with motion—principles which have always been the *causæ belli* wherever the names of Thomas and Taylor are known; and these were again discussed when Dr. V. P. Gibney's paper on "Immobilization in Articular Disease" was read. Dr. Gibney's concluding remarks on this subject are very positive and important: "In concluding, let me state firmly my belief that whatever ankylosis occurs in a joint which has been subjected to immobilization, occurs not by reason of the immobilization, but of the nature and intensity of the inflammation, and of the inefficiency of the apparatus employed."

It was proven that the most important factor to the treatment of joint-

¹ The Medical Record, May 4, 1889, p. 477.

disease was immobilization, and we believe, as Dr. Phelps remarked in the discussion, that "the more perfectly a joint is immobilized the better the results will be, but that immobilization *cannot be accomplished without extension.*"

This volume contains also a well-written and practical article on the "Etiology and Pathology of Rachitic Deformity, with a Report of One Hundred and Fifty eight Consecutive Osteotomies without Suppuration," by Dr. Charles N. Dixon Jones. In speaking of the etiology, he supports the views of Dr. W. B. Cheadale, that primarily rachitis is a diet disease which can be produced at will, the chief defect being a want of animal food, with a deficiency of phosphates and animal proteid, accentuated by evil hygienic conditions, and modified by the concurrent existence of congenital syphilis and scurvy. Speaking of its surgical treatment, he condemns the osteoclast as "an instrument of tremendous and brutal power," and advocates successive osteotomies combined in some cases with tenotomies, having in one case performed as many as eighteen osteotomies. Doubtless, in the hands of skilful surgeons who observe all due antiseptic precautions, this operation is entirely free from danger, but it must not be forgotten that at least four deaths have resulted from osteotomies, besides numerous cases of severe local and constitutional disturbances. Again, as Dr. Phelps remarked in discussing Dr. Vance's paper on "Femoral Osteotomy," "such cases (septicæmia) should not be classed as deaths from osteotomy, but charged up to the accident of the operator" (p. 164). No deaths have yet been reported from osteoclasis, and hence, for general recommendation, in the shafts of long bones away from joints where osteoclasis will lead to the same result, it is the safer and simpler procedure. The author's method of suspending the limbs after osteotomy is excellent, but the same has been in use for some time in Dr. Rupprecht's wards in Dresden. Altogether, the article is a valuable contribution to the subject of rachitis, and the surgical treatment of the deformities resulting from it.

Notwithstanding the seldom occurrence of double hip-disease, Dr. John Ridlon has recorded fourteen cases which have come under his observation since 1884. He holds that:

"The disease seldom *begins* in both hip-joints at the same time; and the *second* joint may become diseased while the patient is resting in bed under treatment for the *first* joint. In other words, *traumatism* can be excluded from the elements of causation of the disease in the second joint in very many cases.

"The joint that is first affected is often last to recover. This would seem to be due to the fact that before *both* joints are involved, and after one has recovered, the patient is allowed to walk around, giving the *one* diseased hip both pressure and motion, thereby delaying the cure and forming ankylosis with flexion and adduction.

"The duration of the disease in the *first* hip is usually somewhat less than that of the average case of hip-disease, while the duration in the *second* hip is usually much less than that of the first. This, it seems to us, can only be accounted for by the fact that during the time that both hips are involved the patient is kept pretty rigidly in bed, thus removing the superincumbent weight, and by that much diminishing joint destruction."

In regard to treatment, the weight and pulley was found uniformly to relieve pain, but to prevent flexion, adduction, or spontaneous subluxation after abscess the application of the double long traction splint was much more effective, and gave better results "when used upon a patient

confined to bed during the acute stage of the disease" than when used as an aid to locomotion. The author favored the double hip-splint of Thomas, which, he says, "serves a better purpose." "The more absolutely quiet the patient be kept, and the longer the period of quiet, the shorter will be the duration of the disease and the better the ultimate result." Only one of the cases died, "and that from tubercular meningitis supervening at the time when the general health was good." This is a valuable contribution to our meagre knowledge of this subject.

One of the best papers in the collection is from the pen of Dr. Newton M. Shaffer, "On Some of the Deformities of the Tarsus in Congenital Equino-varus," whose skill in applied mechanism has accomplished so much to relieve these deformities without operative interference. In considering the subject from an anatomical standpoint, he assumes

"the following as a basis to treat the conditions under consideration: First, that there is a compound deformity in equino-varus, due to rotation of all the bones of the tarsus upon three distinct axes—that is, transverse, antero-posterior, and vertical; secondly, that this compound deformity is due to a loss of relation between muscular and osseous growth, not to muscular contraction or contracture, as has generally been supposed; thirdly, that the principal obstacles to the reduction of the deformity are (1) the position acquired by the astragalus with or without an intrinsic deformity of the neck, and (2) the ligamentous shortening; fourthly, that these difficulties are much increased by the progressive ligamentous and osseous changes that occur as the direct result of prolonged malposition; and fifthly, that the deformities of the medio-tarsal joint are secondary in importance to those which occur at the astragalus" (p. 297).

The mechanical treatment is directed to overcome each of these three varieties of rotation—the *transverse* at the elevated heel; the *antero-posterior* at the inward rotation of the os calcis; and third, the *vertical*, the inversion of the entire foot. Speaking of the structures which resist restoration, he regards the internal lateral ligament "as being far more important than the gastrocnemius or plantar shortening," and says: "If we can find some means to overcome this shortening of the internal lateral ligament, I am sure we will find that the duration of the treatment of congenital equino-varus will be very materially shortened, and much better and far more permanent results will be secured" (p. 299).

In the new apparatus presented, the traction force applied to the outer side of the leg and foot is more accurate, simple, and powerful than the pushing force.

The volume is an excellent specimen of the printers' art, and reflects great credit on the Association.

J. K. Y.

DISEASES OF THE SKIN. By W. ALLAN JAMIESON, M.D., F.R.C.P.ED. Second Edition, Revised and Enlarged. 8vo., pp. xvi., 573. Edinburgh and London: Young J. Pentland, 1889.

THE present edition, following so soon after the first, "has not," as the author states, "permitted sufficient time to elapse to render necessary any extensive alterations in the plan of this work." And yet, in looking over the text, it is found that in several particulars important

changes have been made, two new chapters, on epithelioma and hygiene of the skin respectively, incorporated—in all adding about thirty pages of new matter.

This volume, like its immediate predecessor, reflects in a great measure the teachings of British dermatology, although it also contains much that has been imbibed from Unna's methods and writings, due credit for the same, however, being given to that indefatigable worker. This publication is not as elaborate or exhaustive as most of its contemporaries, but the subject-matter is presented in a clear and concise manner, and the therapeutical directions, while evidently for the most part based upon the author's own practice, are intelligible and free from discursiveness and ambiguity. We note that our English *confrères* still cling to the belief of the non-existence of Hebra's prurigo as a disease, and also hold to the earlier applications of the term "lichen."

An innovation that deserves mention is the plan of giving, at the end of each chapter, references to the several atlases in which the various diseases immediately discussed may be found clearly depicted. The volume itself contains eight colored illustrations, but these, with one or two exceptions, can scarcely be considered creditable productions.

H. W. S.

SURGICAL OPERATIONS. Part II. AMPUTATIONS, EXCISION OF JOINTS, OPERATIONS ON NERVES. By SIR WILLIAM MACCORMAC, Surgeon and Lecturer on Surgery at St. Thomas's Hospital, London. 8vo., pp. 135-490, with 256 illustrations. London: Smith, Elder & Co.

OF the 350 pages contained in this, the second and much the larger part of what is still an uncompleted work, the author has given half to amputations, one-third to excisions, and the remainder to operations upon nerves, but it must be noted that a very large part of the space is given up to the exceptionally numerous, large, and well-executed woodcuts; by actual measurement of those found in fifty consecutive pages, chosen at random, it appears that more than sixty per cent. of the space is thus employed.

The first sixty pages are devoted to general considerations upon amputations, including the indications therefor, the preparation, mode and time of performance, and a comparison of the principal methods; then follow descriptions of individual amputations and disarticulations, each being preceded by a brief statement of the injuries or diseases which may require it, and a longer or shorter description of the anatomy of the region. Occasionally the relative merits of rival operations are discussed, and the mortality indicated by statistics, which are, unfortunately, drawn in large part from pre-antiseptic days. The same plan is followed in the remaining two sections, much space being given in the last one to the anatomy and distribution of the nerves.

The descriptions of the operations are clear and sufficiently detailed to meet the needs of the practitioner who has already had some experience in surgery, and it is evidently for this class, rather than for the student who desires to practise upon the cadaver, that the book has been prepared. This is additionally shown by the introduction of much material that does not belong, strictly speaking, to operative surgery, such as the

means of diagnosis in many cases, complications and results, and some rather lengthy statements of contradictory or restricting opinions held by various surgeons concerning the choice of methods of treatment or of operations. It is usually left to the reader to determine to which opinion the greater weight should be given, the author contenting himself with an indication of the points to be considered. To those fitted by experience and training to profit by it, the book will be of great value.

The paper and type are excellent, and the woodcuts of unusual merit.

L. A. S.

EXPLORATION OF THE CHEST IN HEALTH AND DISEASE. By STEPHEN SMITH BURT, M.D., Professor of Clinical Medicine and Physical Diagnosis in the New York Post-Graduate Medical School and Hospital; Physician to the Out-door Department (Diseases of the Heart and Lungs) of the Bellevue Hospital. 12mo., pp. 206. New York: D. Appleton & Co., 1889.

THIS little book is evidently the work of a teacher. The author has well-defined opinions, and is accustomed to clear expression of them. The teaching itself is usually good. We do not altogether agree with some of Dr. Burt's explanations of the mechanism of the various normal and abnormal sounds heard upon auscultation and percussion; but as the points of difference are still *sub judice*, we have no adverse criticism to express in this respect. We cannot agree with the author, that true, limited "whispering pectoriloquy" is heard over merely solidified areas of lung-tissue. There must be some continuous hollow conduction. It is the voice of the speaking-tube, not of the telephonic rod. We do not see what is gained by the enumeration of "calormetation" among the methods of physical exploration of the chest, or by the substitution of this term for "thermometry." If surface-temperature were meant, we might assent to the position assigned to heat among the physical signs of thoracic conditions; though even then it would tend to distract the attention of the student from the fact elsewhere properly emphasized by the author, that physical exploration of the chest reveals only mechanical (or physical) conditions, and not pathological states. But temperature simply serves with other objective and subjective phenomena to aid us in interpreting the pathological significance of the physical conditions discovered, and should not be enumerated among the conditions it is to explain. With this exception, we can commend the book as among the best of its class, both in design and in execution.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

NITROGLYCERINE, ESPECIALLY IN CASES OF EMERGENCY.

DR. JOSEPH B. BURROUGHS has recently called the attention of the profession to the effects of this drug, the rapidity of its action, and lack of taste when taken in water. It was introduced into medical literature as a remedy in neuralgia and nervous affections about thirty years ago. About ten years ago Dr. Murrell recommended it as a useful means for the relief of angina pectoris. It may be had in the form of pills, perles, and triturations, as well as in the form of a one per cent. solution. This last is least liable to change and is the handiest to use. Care should be taken to keep the bottle tightly corked or by evaporation the strength may be increased.

One drop is a dose of the one per cent. solution; this may be taken in water, the physician dropping ten drops into a tumbler and adding ten teaspoonfuls of water; one teaspoonful now representing one drop of the remedy. If there is need of great haste, or if the patient cannot swallow, from being unconscious, one drop can be placed within the lower lip or upon the tongue; the drug may be given subcutaneously, but so rapid is its absorption through the mucous membrane of the mouth, that unless the syringe should happen to be filled it is doubtful if time would be gained. Patients differ in the amount required to produce an effect: some requiring less than one drop, others requiring three or four drops to produce the same effect; the usual dose, however, is one drop.

Patients also differ in the duration of the effect of the drug. Usually the effect lasts three or four hours, but in a few cases the effect has ceased in twenty or thirty minutes. To avoid alarming people the less formidable names "gloovin" or "trinithin" may be used. When given by the stomach the effect is apparent in a few minutes, the pulse being increased from ten to twenty beats and becoming full and regular. In a few cases there is a slight headache, lasting for a few minutes.

In larger doses the face becomes flushed, a severe headache is experienced, accompanied with a feeling of fulness, singing in the ears, flashes before the eyes, and all the symptoms of an increased supply of blood to the brain. On account of this effect on the cerebral circulation, care should be taken in administering the remedy to the aged, as the sudden expansion of the cerebral vessels might cause a rupture of their weakened calcareous walls.

In case of a poisonous dose of nitroglycerine having been taken, we should select as antidotes such drugs as act in an opposite manner upon the vasomotor nerves. Our object should be to cause contraction of the arterioles. The most desirable agents for this purpose are strychnine, ergot, and atropine. These agents should be given subcutaneously.

In comparing alcohol, ether, and nitroglycerine we find that in all three there is, first, a period of excitement, when the heart beats quicker and fuller, and the brain, from increased supply of blood, is more active. In all three this first stage or effect is followed by a second effect, a stage of unconsciousness. With ether this first stage is soon reached and passed, and the second stage—that of unconsciousness—is rapidly entered. With alcohol the first period is of longer duration, larger quantities of the drug and a greater length of time being required to pass from the first stage into that of the second stage.

Nitroglycerine, compared to the rapidity of action of the other two drugs, enters the first stage almost instantly, and the stage of unconsciousness only after a poisonous dose is taken. Nitroglycerine should be preferred to alcohol in every case of emergency, because it acts with greater rapidity, can be given during unconsciousness, one drop is equal to an ounce of brandy, and it cannot create or arouse a slumbering appetite for the drug.

Cases are reported in full of the use of this remedy in angina pectoris, faintness during a minor surgical operation, rapid prostration in typhoid fever, in opium poisoning, in uræmic coma, in nephritis; benefit has been observed in chronic inflammation of the kidneys from the use of nitroglycerine. Its use is further suggested in persons apparently dead from drowning. In all such cases nitroglycerine would be of great benefit, heat to the body and the expansion of the chest not being neglected.—*Lancet*, June 22 and 29, 1889.

MERCURIAL SALTS AS DIURETICS.

The use of large doses of calomel in cases of dropsy has attracted great attention, especially on the Continent, but the mode of treatment has not been much in vogue in England. The reason for this lies in the fact that calomel has to be administered in such large doses as to produce stomatitis, which must be treated by astringent gargles, and to cause diarrhoea, rendering opium necessary. It is, perhaps, a question whether such severe effects do not counterbalance the diminution of the dropsy. It is not to be denied, however, that in some cases, especially of cardiac dropsy, in which calomel is well borne, the mode of treatment is decidedly beneficial. Jendrassik stated that calomel was a diuretic only in œdematous conditions; but Biegarski has found that, if continued for a sufficient length of time in the healthy subject, it produces in from two to ten days distinct diuresis. This last observer has also investigated the action in the same direction of subcutaneous injections of corrosive sublimate and inunction of blue ointment. Both these produced

diuresis, the subcutaneous injections most powerfully, the inunctions least, whilst the internal administration of mercury might be considered as intermediate in power. Small doses had no diuretic action whatever; only medium and large doses increased the amount of urine.

The action was most marked in dropsy due to cardiac disease, and Biegarski asserts that the mode of treatment diminishes, and even cures pathological changes in the kidney. Mercurial salts, indeed, seem to act as diuretics by stimulating the kidney substance during their excretion in the urine.

Another observer, Shirtzig, confirms the above conclusions, especially as regards cardiac dropsy, in which disease digitalis may be combined with calomel. In dropsy due to kidney disease and to portal obstruction mercurial salts are of very little use.—*British Medical Journal*, June 22, 1889.

COCAINE POISONING.

In the *Semaine Médicale*, LÉPINE has collected reports of many cases of poisoning by cocaine, given subcutaneously, in enemata, by injection into the urethra, after application to mucous membranes in the form of spray, etc., in which serious or fatal symptoms followed its use. In the way of treatment the inhalation of nitrite of amyl, to relieve the vaso-motor stimulation, is recommended; for severe convulsions, chloroform or chloral, opium has proved serviceable in many cases.

From these cases Lépine draws the conclusion that not more than three grains should be injected at once, and not more than six or seven grains should be brought in contact with a mucous surface.

It is well to exercise especial care in anæmic or in nervous patients, in whom cocaine poisoning is more easily brought about. To avoid anæmia of the brain, a horizontal position, or a preliminary inhalation of three drops of nitrite of amyl are suggested.—*Wiener klinische Wochenschrift*, June 27, 1889.

ECZEMA FROM CREOLIN.

On account of its having very little toxic action, DR. WACKEZ used creolin as a dressing for wounds in children. Of seventeen cases, in which there were slight wounds, ten healed by first intention, while seven speedily developed a local eczema,

On the second day of treatment with creolin the vicinity of the wound was much reddened; on the third day, small and large blisters appeared. The temperature was increased, and the neighboring glands were enlarged, the patients suffered from anorexia, headache, and sometimes vomiting.

In order to decide whether these appearances were due to the creolin, or whether some of the other antiseptics might cause the same symptoms, an experiment was tried on a boy, six years old, who had fallen in the street, and had slight wounds on both hands. The abrasions of the right hand were treated with a creolin solution of 1 to 1000; those of the left hand with a 1 to 1000 of corrosive sublimate solution. On the third day an eczema appeared on the right hand; while on the left hand there was no trace of redness. The left hand was then treated with a three per cent. carbolic solution, while the creolin solution was continued on the right hand; on the next day the left

hand showed nothing out of the way, while the epidermis of the whole palm of the right hand was covered with blisters.

After opening the vesicles on the right hand the creolin was omitted, and the wounds were dressed with an ointment. The creolin solution was now applied to the left hand, and after three days ten small blisters appeared, which burst, and the epidermis came off about two days later.—*Therapeutisch. Monatshefte*, June, 1889.

MENTHOL AND SAFFROL IN NEURALGIAS.

Menthol has a distinct use in relieving neuralgias of the fifth nerve and other local painful affections. Its local employment, either in stick or in plaster, is very popular. It is, in fact, a local anæsthetic, and, moreover, when applied in plaster, gives a comforting sensation of warmth to the painful part. Its action, so applied, is not, however, very powerful. Its internal administration has been advised by Dana for many painful affections. In doses of five to twenty grains it gives a pleasant feeling of warmth, while it stimulates the cardiac action, without increasing its rapidity, and raises the arterial blood-pressure. But the chief action noticed was that it relieved pain. It was found especially valuable in megrim, and in supraorbital neuralgia, and in the headaches of neurasthenic and anæmic patients. In some cases of sciatica relief was obtained; thus adding another drug to the multitude which may be used, often without effect, in this neurosis. Dana goes so far as to recommend menthol in preference to antipyrin in certain cases, in weakly and anæmic individuals, in whom the administration of antipyrin is not without danger, owing to its tendency to produce collapse.

Saffrol was also found to have the same effect as menthol. It is the liquid stearoptene of oil of sassafras, and may be given in headache and sciatica in doses of twenty drops.—*British Medical Journal*, June 22, 1889.

GLYCERINE AS A PURGATIVE.

DR. KARL ULLMANN contributes an exhaustive article on this subject, which can already boast of quite an extensive literature.

Mixed with water, glycerine enemata were often attended with failure in chronic constipation. A syringeful of pure glycerine (45 m) was administered, and the cases selected were those in which constipation had existed for at least two or three days, the maximum duration being twelve days. Two hundred and twenty-six enemata were given. The quantity of the dejections varied, in 31.4 per cent. the stools were copious, in 45.5 per cent. they were moderate in amount, and in 23.1 per cent. they were very scanty, containing merely the injected glycerine, mixed with some mucus and a brownish fluid. In 83 per cent. the stools were hard, consisting chiefly of scybala; in 13 per cent. they were fatty and unformed, and in 4 per cent. they were of a diarrhœic nature. Subsequent constipation occurred in 39 per cent. Diarrhœa followed in only 3 per cent. Painful sensations during the stool, or immediately afterward, such as burning in the rectum and colic, were complained of by only five patients, three of whom were suffering from acute parametritis and from retroversion of the uterus, one from chronic tubercular peritonitis.

Of the fifty-two cases in which the enemata failed, the author could find no

cause for the failure in the primary disease. In all, however, he was enabled to detect by palpation an atonic condition of the rectum, or an accumulation of the fecal mass higher up than usual.

Dr. Ullmann favors the theory that the local purgative action of glycerine is due to its power of abstracting water from the tissues, and in this way irritating the rectal mucous membrane, and causing contraction of the muscles of the rectum. Enemata of glycerine are servicable where, for any reason, a rapid evacuation of the lower part of the bowel is indicated. They are of no use when the accumulation of feces is in the upper part of the large bowel or in the small intestines. They are contraindicated in ulcerative conditions of the rectum, and in painful inflammatory affections of neighboring parts. In habitual constipation they cannot replace dietetic regimen, massage of the bowels, and well-known aperients. Further observations are necessary to determine whether their continued use is not injurious to the rectal mucous membrane.—*New York Medical Journal*, June 1, 1889.

STROPHANTHUS AS A LOCAL ANÆSTHETIC.

Many of the drugs which are useful in the treatment of cardiac disease also possess a local anæsthetic action. There is, of course, no connection, as far as can be seen at present, between the two actions. The local anæsthetic action of erythrophleine was investigated last year by many observers; the conclusions arrived at were that, although it possessed a powerful local anæsthetic action, it causes irritation and dilatation of the vessels of the conjunctiva, and in some cases even severe inflammation. It was thus much inferior to cocaine, whose action is accompanied by a constriction of vessels and consequent pallor of the part. Helleborin, the glucoside from the Christmas rose, is also a local anæsthetic and cardiac tonic.

The local anæsthetic action of strophanthus is, therefore, chiefly of pharmacological interest, like that of erythrophleine.—*British Medical Journal*, June 22, 1889.

MEDICINE.

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GOUT; ITS NATURE AND TREATMENT.

In the *Medical Press and Circular* of June 5, 1889, is an abstract of recent papers by Ebstein and by Pfeiffer on this subject. EBSTEIN divides gout into two great classes: 1st. Those of joint affections. 2d. Those attacking the

kidneys. The first form is the typical form of gout, where the joints and their surroundings become affected by the morbid process. The attack usually comes on by night, and the favored seasons of its approach are the spring-time and the end of the autumn season. After localizing it in the great toe, he said accumulations of gouty matter were to be observed in young people afflicted with the disease. These enlargements are closely connected with the uric acid found in gout. Ebstein is opposed to the opinion held by Garrod regarding these enlargements—*i. e.*, that they are caused by an excess of uric acid in the blood, which, in the form of sodic salt, becomes deposited in the tissues of the joint, and by this gradual accumulation and final irritation produces the gouty inflammation commonly accompanying this affection. He considers this deposit of the urate of soda to be the result of the inflammation, and not the cause, as Garrod believes it to be. He next referred to the effect of the gout on the nervous system, through which he considers the heart and bloodvessels become affected. He is quite satisfied that gout is hereditary in families, but that it does not confine itself to the indolent and high-fed, but rather afflicts the active and moderate liver and the industrious class. In females the attacks are not so intense as in males. Men suffering from gouty affections may reach a good old age, though the diathesis is fraught with much danger to life.

PFEIFFER holds the view that uric acid is diffused through the fluid tissues of the body in a very insoluble form, which soon becomes deposited throughout the body, or is localized in the form of swellings. The earliest effects are the retention of uric acid, which rapidly accumulates in the system until every organ becomes more or less affected; or, if it happens to expend its force on a single organ, death may be the result.

The first indication, therefore, in the treatment would be the excretion of a proper amount of urea and uric acid in the urine, since their retention soon produces a low cachectic condition of the system. After this, the administration of a salt that will convert the insoluble substance into a soluble substance allowing of rapid elimination, soon relieves the pain and reduces the swelling. The first important step is to correct the diet. This should consist largely of albuminous matter, as beef, eggs, etc., as well as fat and green vegetables; but fermented drinks, starch, and sugar should be forbidden. The use of a meat diet is very important, as the retention of the urea and uric acid quickly produces a cachectic condition of the system which must be early combated in the treatment, but the meat diet does more than supply this necessity, for the salts of the meat, when taken into the system, have a solvent influence that speedily raises the elimination of urea and uric acid to even more than the normal quantity. The same may be said of all proteid substances, and more particularly of eggs. Sour milk and cheese should be avoided, but fruit and salads are beneficial, as they alkalize the alimentary canal, while wine and beer have the opposite effect, and should be strictly prohibited.

The medicinal treatment should consist in the administration of some alkaline salts, and the carbon salts seem to be the best, though phosphoric acid and boracic acid have in some cases proved beneficial. Hydrochloric acid and sulphuric acid are objectionable. All alkaline and mineral waters should be given in small doses to begin with, and gradually increased. The mineral

water of Fachingen is the most efficacious, although those of Kaiser Friedrichquelle, of Offenbach, are to be commended. The author knows of nothing that could surpass the mineral baths of Wiesbaden in the treatment of gout. One week with a thermal bath of 28° Reaumur daily will restore to health the most gouty patient, and a prolongation of the treatment will soon dissolve any old chronic swellings that might happen to be present. In very rapid and acute cases he thinks the best good can be obtained by the free use of salicylate of soda.

THE MOVEMENTS OF THE THORAX AND LUNGS CONSIDERED IN THEIR
RELATION TO CERTAIN PULMONARY DISEASES.

J. W. ROOSEVELT (*Medical Record*, May 25, 1889, p. 566) says that no satisfactory reason has been given for the frequent selection of the upper lobes of the lungs by the tubercle bacilli, and of the lower lobes by the pneumococci. It is difficult to imagine a selective action of air-currents, which drives one up and the other down in the air-passages. Believing the study of the chest-movements of great importance in this connection, he made a series of observations on professional models. The first point noted was that the sternum moves but little, particularly in an antero-posterior direction. The upper part seems to advance more than the lower; and in deep inspiration the bone seems to bend at the junction of the gladiolus and manubrium. The greatest motion of the chest is the expansion at the sides in the neighborhood of the anterior axillary line. The motion of the ribs is not about two axes, as is usually described; and, indeed, this double movement is rendered almost impossible by the anatomy of the parts. Experiments upon the cadaver and upon animals have shown him that revolution around a single axis will explain nearly all the movements of a rib—this axis being a line drawn from the tubercle to the middle of the articulation with the vertebral body. Such a line runs from within somewhat outward, from before backward, and from above downward.

Regarding the degree to which the lungs are moved by the ribs, it is evident that it is important to determine, not whether the upper lobes are actually moved less, but whether the expansion is less in proportion to their bulk. If there were any difference in the expansion of the lobes, it would be expected that with the thoracic breathing of females the upper lobes of this sex would be less often affected with tuberculosis than in the case of males; but experience teaches that this is not the case. It is easy to see that it is along the attachment of the ligamentum latum and along the vertebral column that the lungs must actually (not relatively) expand the least, yet the evil effects of deficient expansion in the shape of tubercle are not often seen here. In fact, it cannot be shown that any part of the lung receives less in respiration in proportion to its bulk than does any other part.

The author shows that it is impossible for the upper lobes to be expanded in coughing or any act of forced expiration by air driven into them from the lower lobes. Theories which have been advanced with regard to assumed peculiarities of respiration in the upper lobes would apply as well to the distribution of one form of bacterium as to another, and the same is true of fine dust. He claims, therefore, that no explanation exists of the frequent selection of any lobe by any inhaled bacterium.

THE BROMIDE TREATMENT OF EPILEPSY.

GAUSTER (*Wien. med. Presse*, 1889, xxx. 609) details three cases of epilepsy, which he selects out of a large experience, because their treatment extended over a long period of time. He concludes his article as follows:

1. The bromide treatment is at present certainly still the best in epilepsy of different sorts, especially in the idiopathic form.

2. As a rule, however, it must be continued for years. The size of the dose is to be determined in each case by careful trial and observation, both as to the amount which may be given during the activity of the disease, and as to the dose which shall be continued during years after the improvement of the patient.

3. Under a careful observation of the patient's condition, even as much as twenty grammes daily may be administered for a considerable time without injury.

4. The increasing of the dose should be stopped, or the amount should be diminished until it is temporarily or permanently replaced by some other drug:

(a) If severe digestive disturbances appear, so that the nourishment of the patient appears to be endangered in a high degree.

(b) If very evident and persistent catarrh with slight dulness develops at the apices of the lungs.

(c) If deep ulceration of the skin, or marked aggravation of previously existing chronic cutaneous disease appear.

5. Diminution of the intellectual power during the bromide treatment is, as a rule, no sufficient reason to abandon the treatment or materially diminish the dose.

6. Pulmonary tuberculosis, severe chronic cutaneous diseases with a tendency to ulceration, and marked disturbances of nutrition are contraindications to the bromide treatment, unless the mastery of the paroxysms be a question of saving life or of holding in check a severe psychosis.

7. Moderate emaciation is no contraindication, since the weight can be gradually made to increase during the use of the bromides, by administering suitable nourishment.

8. During the bromide treatment particular care must be taken that a large amount of food be ingested; and at not too long intervals examination of the lungs and of the skin should be made.

 THE THERAPEUTICS OF PNEUMONIA.

CANTANI (quoted in *Centralbl. f. d. ges. Therap.*, May, 1889) contributes a useful article on this subject. In cases running a regular course the expectant treatment is the best. The less the physician does, the greater the probability of recovery. Sometimes certain symptoms demand special treatment. When an unusually tenacious secretion occludes the smaller bronchioles, and prevents the air from entering the alveoli, it is necessary to make this more fluid. This can be done by the use of bicarbonate of soda, chloride of ammonium, iodide of soda, or senega. If expectoration is rendered difficult by threatening paralysis of the bronchial muscles, small doses of ipecacuanha are indicated, combined with a stimulant, as alcohol, ammonia, etc. In impending

œdema of the lung ipecacuanha in emetic dose is to be avoided on account of its depressing action on the heart. The act of vomiting itself may prove injurious in conditions of adynamia. If there is danger of œdema of the lung and the pulse is strong, it would be better to induce vomiting by irritating the palate, or by giving apomorphine.

Cardiac weakness demands attention. If this condition be the expression of marasmus, or of anatomical changes in the heart, all therapy is useless. If, however, it be due to exhaustion of the right heart from extensive infiltration of the lungs, the energy of the heart must be increased, best through alcohol or strophanthus. Digitalis is not to be recommended; and the author is opposed to the administration of alcohol at the commencement of every case of pneumonia, lest the myocardium be exhausted thereby. In the event of purulent infiltration such balsamic drugs as turpentine are useful, given both internally and by inhalation. In venous congestion of the brain, with somnolence, sopor, and cyanosis, leeches to the nose and under the eyes are of service.

The author is opposed to antiphlogistic and antipyretic procedures in pneumonia, except only that excessive high temperature be combated. The chief use of the cold bath is to increase expectoration when this cannot be accomplished in any other way. Warm moist applications to the breast he prefers to cold. He does not recommend the modern antipyretics, on the ground that they depress the heart as well as the temperature, and frequently cause collapse. Venesection is to be abandoned except in threatening suffocation from pulmonary œdema in robust individuals, and when the heart is sufficiently powerful vesicants and sinapisms.

TREATMENT OF PULMONARY TUBERCULOSIS WITH GUAIACOL AND CREASOTE.

BOURGET (*Correspondenz-Blatt f. Schweiz Aerzte*, 298, May 15, 1889) says that of all the remedies recommended for the treatment of phthisis, beechwood creasote is the only one which retains its ascendancy, although some pessimistic physicians still reject absolutely all treatment as useless. It is evident that not much is to be attained when creasote is given in doses of only two to three drops a day, but it is otherwise when larger amounts are administered. It is necessary to make the patient take the largest dose possible, without reference to what the Pharmacopœia says on the subject, only seeing that the digestive system is not seriously disturbed thereby.

Guttmann has shown that tubercle bacilli will not grow in solutions of a strength of 1 : 2000 creasote, while cultures are but feeble in a concentration of 1 : 4000. To charge the blood in the proportion of 1 : 4000 would require the ingestion of 15 grains of the drug daily, an amount which this writer did not find it possible to give, though he administered 9 grains. Sommerbrodt has given 12 grains daily inclosed in capsules. This plan Bourget condemns on the ground that the drug thus administered will produce a very active circumscribed inflammation at the point where the capsule empties its contents. Pills of creasote made up with some resin, in the usual manner, are equally objectionable, since his experience confirms that of Goetz and Gilbert, that they very generally pass through the intestine undissolved.

For about three years he has used with very satisfactory results a method of internal and external treatment which he calls the "intensive method," and which consists in saturating the system with creasote without inconveniencing the patient. For the internal treatment he prefers guaiacol dissolved in wine, or, in winter time, in cod-liver oil. The wine is given in tablespoonful doses, each of which contains about one grain of guaiacol. Little by little this is increased to 2-3 tablespoonfuls, until many patients are able to take 15 grains of guaiacol daily. In cases in which there is a disgust for the wine or it disagrees with the stomach, the author administers the drug by enema, in the form of an emulsion. The two forms of administration can sometimes be alternated with advantage, giving the drug by the mouth for twenty-five days, and then by the rectum for an equal time.

At the same time the author employs externally a mixture of 20 parts of creasote and 200 parts of cod-liver oil. On retiring, the patient's chest, back, and axillæ are rubbed with this. During the night, and when possible during the day also, an inhaler is worn, in which a few drops of creasote are placed.

Gradually the patient is, in this way, saturated with creasote in an amount sufficient to interfere considerably with the evolution of the bacilli. To obtain success the treatment must be continued without intermission for three to four months.

AN UNUSUAL ANOMALY OF THE PULMONARY VALVE.

STINTZING (*Deutsch. Arch. f. kl. Med.*, B. xlv. 149) describes, with an illustration, an interesting case of pulmonary insufficiency, the valve possessing only two leaflets. The patient was a woman of sixty-four years, who had always worked hard, had suffered several severe attacks of illness, and had borne six children. She had inflammation of the lungs eight months before, since which time she had experienced shortness of breath, cough, and pain in the side, head, and feet. More recently she had suffered from frequent attacks of palpitation and dizziness. When examined she exhibited cyanosis, constant cough, and a few rhonchi in the lungs. The apex-beat of the heart was diffuse; the cardiac dulness reached considerably beyond the right border of the sternum. There was diastolic murmur, whose point of maximum intensity was at the third and fourth cartilages on the left side. At the corresponding point at the right border of the sternum the murmur was fainter, and a dull but clear second sound could be heard.

The patient's condition grew worse, the apex-beat became weaker, albumin appeared in the urine. A very sharp post-systolic murmur could be heard at the left border of the sternum. At the origin of the aorta both sounds were dull but clear.

The autopsy revealed hypertrophy and dilatation of the right ventricle, some degree of emphysema of both lungs, and a defective formation with insufficiency of the pulmonary valve. Two of the leaflets, namely, were of normal appearance, while between them was an apparently rudimentary leaflet, leaving a triangular opening. The leaflet, which the author describes in detail, was smooth and covered by endothelium.

The author discusses the few reported cases, which in any respect have

resembled his, and then endeavors to determine the mode of origin of this anomaly. He concludes that it is extremely improbable that the defect was due to endocarditis, which could hardly have been limited to *one* leaflet and have left it perfectly smooth and thin. It is also quite certain that the cause was not atheroma. The condition must have been congenital, though against this supposition is the fact that the patient had lived so long without cardiac symptoms, and with a disease which usually so soon makes its presence known. He believes this may be explained on the supposition that the insufficiency only became a matter of importance in later years with the widening of the lumen of the vessel. The emphysema or the inflammation of the lungs could have been the cause of the increased pressure which produced the widening of the pulmonary artery.

From a clinical point of view the case is also instructive, as showing the difficulty of distinguishing between this condition and insufficiency of the aortic valve. During life the case had been diagnosticated as the latter affection, and the author reviews the reasons justifying this diagnosis.

He concludes that pulmonary insufficiency can only be recognized, 1st, when the hypertrophy or dilatation of the right ventricle can by physical examination be distinguished from a like condition of the left ventricle (the diagnosis of this condition resting on the enlargement of the cardiac outline, especially toward the right with the apex beat felt more distinctly in this direction, and the presence of strong epigastric pulsation); 2d, when the pulse, in a state of good compensation, does not exhibit the characteristic quality of that of aortic insufficiency.

THE CAUSE OF ANÆMIC HEART-MURMURS.

At the close of a long discussion of this subject SEHRWALD (*Deutsch. med. Wochenschr.*, No. 21, 1889) draws conclusions, which may be summed up as follows:

1. In defining anæmic heart-murmurs the principal feature is that the heart is completely intact. All those attempts at explanation are therefore to be abandoned which resort to any secondary anatomical cardiac alteration.
2. So also, theories are untenable which explain some of the peculiarities of these murmurs, but leave others unexplained.
3. As none of the numerous hypotheses fulfil both of these conditions, a new one must be sought which rests solely on the existence of anæmia, and at the same time accords with clinical observations.
4. Of the many murmurs arising in the circulatory apparatus, only the venous hum can be considered analogous to the anæmic heart-murmur, since only this is due in like manner, and exclusively, to an under-filling of part or the whole of the vascular system with blood.
5. Venous murmurs are produced as soon as the lumen of the jugular vein becomes so narrow, on account of the imperfect distention, that the bulbous acts only as a sudden dilatation in which consequently the fluid makes eddies and noises. The anæmic heart-murmurs arise through an imperfect filling, and consequent narrowing, of the great veins emptying into the heart. The small quantity of blood contained in them pouring into the wide-open auricle, produces here also eddies and noises.

6. Since the bulbus venis jugularis is kept permanently open by the cervical fascia, the venous hum is continuous. The auricle, on the other hand, is only open during its diastole, and its murmurs are therefore intermittent.

7. The reëxpanding of the relaxed auricle is brought about by the influx of venous blood, the negative thoracic pressure, the displacement of the atrio-ventricular septum by the ventricular systole, and the simultaneous contraction of the great veins over-distended during the auricular systole. Only the last three factors have any influence in producing an active dilatation, by which the auricle exerts a sucking action on the venous blood.

8. The diastole of the auricle begins with the commencement of the ventricular systole. It is only at this moment that the three factors alluded to act together on the auricle, and at this time, therefore, the auricular aspiration and the production of the eddies and murmurs must be the strongest. Usually, indeed, the murmurs are only heard at the beginning of the systole. Later, during the ventricular systole, only the negative thoracic pressure is acting on the auricle.

9. The conditions for the development of a murmur are much more favorable in the left ventricle than in the right, because on the left side the pressure of the veins is greater, the retraction of the atrio-ventricular septum is more marked, and, especially, the veins are of much narrower lumen than on the right side. Anæmic murmurs must accordingly predominate in the left auricle.

10. Eddy-murmurs in the left ventricle (including such as are regularly formed in mitral insufficiency) are best heard over the position of the auricle in the second left intercostal space; or over the ventricle down to the seat of the apex. The predominant occurrence of anæmic murmurs in the pulmonary and mitral areas agrees with this statement.

11. The development of anæmic murmurs in anæmia, cachexia, fever, etc., and the modification of the murmurs under different conditions may all be satisfactorily explained by the two factors;—altered degree of fulness of the pulmonary veins and change in the aspiratory power of the left auricle.

12. Anæmic murmurs in the right auricle develop with much greater difficulty, and are to be heard under the upper and middle third of the sternum. Clinically they occur very seldom.

The rare *diastolic* anæmic murmur is to be heard over the course of the superior cava, and must be considered a diastolic accentuated portion of a jugular venous hum.

DIPHThERITIC GASTRITIS OR GASTRIC DIPHThERIA.

TALFOURD JONES (*Brit. Med. Journ.*, 1889, ii. 880) reports a case of this very rare affection. The patient, a child of two years and ten months, developed difficulty in swallowing on the third day of the disease; on the sixth, she vomited several times; on the seventh, there was difficulty in breathing and frequent vomiting, the ejection consisting of a little blood and some dark red pieces of a membranous character. Death occurred on the following day. The autopsy revealed a widespread membranous exudation of the pharynx and adjacent parts, the posterior nares, and the larynx down to the cricoid cartilage, where it abruptly ceased. The œsophagus was quite normal in every respect. The stomach had a soft, doughy consistence, and, when

opened presented an irregular, dark, reddish-brown appearance with a slightly olive-green tint. This was found to be the surface of a continuous membrane lining the whole of the stomach. It varied in thickness, averaging one-twelfth of an inch, but being thickest over the rugæ. It was adherent to the mucous membrane, but was easily separated and peeled off, and then exhibited on its under surface the imprint of the markings of the mucous membrane. Except in thickness and in its dark red color it differed little from the exudation in the pharynx.

The rugæ of the mucous membrane were of a black-red hue and studded with a dark red punctiform injection. The mucous lining between the rugæ was of a much lighter color. The intestines were healthy.

Under the microscope the exudation from the stomach presented an irregular fibrillated appearance with numerous red blood-cells and leucocytes.

STUDIES ON THE FUNCTIONS OF THE STOMACH IN PHTHISIS.

F. SCHETTY (*Deutsch. Archiv*, Bd. xlv. 219) says that as all the investigations carried on have as yet failed to give us any specific against tuberculosis, we are obliged to combat the disease in some other way, *i. e.*, by strengthening the organism and making it as resistant as possible to the action of the poison. The dietetic and the climatic treatment are therefore to be considered, and of these the most important is the former, since the latter cannot so often be carried out. As the affection is essentially a wasting disease the dietetic treatment is greatly to be desired, but unfortunately often meets with the greatest obstacles in the form of gastric disturbances. The author quotes extensively from well-known writers regarding the digestive disturbances of phthisis, but says that no satisfactory explanation of the cause of this is offered. The fact that *gavage*, as practised by the French clinicians, is often of great advantage to the patient is an indication that in spite of the patient's dislike for food, there is no abnormality of the digestive capacity of the stomach. He cites the meagre investigations which have been conducted regarding the gastric function in phthisis, and then details the studies which he has made on twenty-five cases of the disease. He chooses both incipient and more advanced cases; those with but little fever, and those with marked pyrexia. He first examined the patient according to the method of Kahn and von Mering, *viz.*, in the morning, on an empty stomach, the patient received two hard-boiled eggs and one hundred to one hundred and fifty grammes of water. After an hour the gastric contents were carefully removed by aspiration with a soft tube, filtered, and examined. The examination consisted in determining: 1. The reaction. 2. The presence of lactic acid by the use of the carbolated-iron test. 3. The presence of free hydrochloric acid by the same reagent, as well as by Congo-paper, *vert brillant*, tropæolin, methyl-violet, and phloroglucin-vanillin (the last of which tests he considers the best). 4. The presence of acetic and butyric acids; tested by the odor. If it was determined that only inconsiderable quantities of lactic, acetic, and butyric acids were present, the amount of free hydrochloric acid was determined quantitatively by titration with one-tenth normal sodium solution. The peptic strength of fifteen cubic centimetres of the filtrate was

then tried on a piece of boiled egg albumen, one millimetre thick and six millimetres in diameter, and the time required for digestion determined.

Within two to three days a second examination was carried out, after the method of Leube; the patient receiving a mid-day meal of soup, beefsteak, bread, and water; and the contents of the stomach being removed after six hours, and tested in the way already described.

The results of his investigations were as follows:

1. The production of hydrochloric acid was in all the cases not diminished in the morning, and in some of them even increased. There was a normal production of acid both in the advanced cases and in those with morning fever.

2. The digestive power of the gastric contents was destroyed in no case; the length of time required in the digestion test was one to two hours, and corresponded to the normal condition.

3. The time required for digestion within the stomach in the afternoon and evening hours was not prolonged, and there existed consequently no motor insufficiency in the cases examined; for in all but three of the cases the stomach was empty after six hours, and in these there was no food remaining, but only some of the gastric secretion. The degree of advancement of the disease, or the elevation of the body-temperature, appeared to have no influence.

It seems certain, then, that the so-called gastric disturbances of many phthisical patients do not always depend on gastric catarrh and a diminution of the secretions. It is of importance, therefore, to make in every case possible an examination of the secretion, in order to be able to determine the most suitable therapy. Cases in which the secretion is found normal are often suitable subjects for *gavage*, and will be benefited by it.

THE RELATION OF BACTERIA TO THE DIARRHOEAL DISEASES OF INFANCY.

L. E. HOLT (*New York Medical Journal*, April 13, 1889) says that in a study of the effects of microorganisms upon the human body, and especially in diarrhoeal diseases, three factors must be kept in mind:

1. The nature of the microorganisms. 2. The dose or numbers in which they enter the body. 3. The vulnerability of the patient.

He then takes up the consideration of the normal conditions present in infants on milk diet, concluding:

1. That the small intestine is acid throughout the upper two-thirds of its course.

2. The source of the acid is the decomposition of the milk-sugar which is present here, though not in large amount.

3. There is no decomposition of casein.

4. All the casein and the greater part of the milk-sugar appear to be absorbed soon after they enter the intestine.

5. Oxygen is absent, with the possible exception of a very small amount next the mucous membrane.

6. But two varieties of bacteria have been constantly found: The *Bacterium lactis aërogenes*, which decomposes milk-sugar principally into lactic acid, and which is found chiefly in the upper part of the small intestine; and the *Bacterium coli commune*, occurring in great numbers in the colon and stools.

That so few varieties are normally present is due to the exclusive diet, the absence of oxygen, and the rapid absorption of both casein and milk-sugar, and not to any action of bile, which is not an intestinal antiseptic.

The normal conditions described may be altered in several ways. Thus, first, bacteria foreign to the intestine may develop, either because there is a failure of digestion and a consequent increase of the amount of unabsorbed material in the intestine; or because the quantity of food given, though of normal character, is too large for the intestine to manage; or because food so improper is given that it is but slightly or not at all acted on. In the second place there may enter with the food pathogenic germs, whose effects will depend on their nature, the number which enter, and especially on whether or not the digestive organs are in a healthy condition. In the third place, poisonous ptomaines may be formed in the food outside of the body, and develop toxic symptoms on being ingested.

Abnormal bacterial growth in the intestine results in the production of a catarrhal inflammation, often very slight for some days, but resulting in the secretion of serum and mucus, and probably in the formation of oxygen; these new conditions in turn tending to greatly increased activity of the bacterial growth with the production of a severe type of the disease. Another injurious effect of the bacteria is that they set up decomposition of food in the stomach and intestines, or increased peristalsis with hurrying along of the food, so that the patient suffers from innutrition. Toxic symptoms are also produced from the absorption of ptomaines.

That children over two years so usually escape is probably because after this time the intestine is very little vulnerable to bacterial attack. Breast-fed children escape because their digestive organs are in a healthier condition and their food free from germs. Hand-fed children suffer most because they are almost always overfed, very many suffer much of the time from a mild form of catarrh, and their food in summer contains germs in abundance.

Prophylaxis is a matter of the greatest import. Germs are to be excluded by sterilizing milk and by absolute cleanliness. The air, too, should be as free from germs as possible; and care should be taken that the mouth is clean. Healthy digestion and absorption must be obtained by building up the infant's constitution, giving proper food at proper times and in proper quantities. During the summer the amount of nourishment should be materially reduced.

Treatment consists in, 1, nourishing the patient; 2, combating the abnormal bacterial growth; 3, treating the lesions. All these indications must be met, but early in the disease the second may be the most important, while later the third is of more prominence.

OLIVE OIL IN CHOLELITHIASIS.

To this, at present much discussed question, ROSENBERG (*Fortschritte der Medicin*, No. 13, 1889) adds the observation that experiments on dogs show that ingestion of large doses of olive oil increase the quantity, while they diminish the consistency of the bile excreted, thus attaining the ideal conditions aimed at in treatment. The experiments were made on dogs with gall-bladder fistulas. It will be noted that these observations are directly opposed to those of other investigators recently recorded in these pages. Other communications will doubtless follow.

SURGERY.

UNDER THE CHARGE OF

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ETIOLOGY OF SUPPURATION.

To this much-disputed question NATHAN (*Archiv für klin. Chirurg.*, Bd. xxxvii. S. 875-879) makes a contribution of great interest in view of the fact that Grawitz and De Bary assert that ammonia, silver nitrate, and turpentine injected subcutaneously into the tissues of dogs produce a suppuration in which no germs can be found.

Nathan used dogs in his experiments; the point of injection was shaved and carefully disinfected by corrosive sublimate solution, 1:1000; the substance used was, after careful sterilization, injected by means of a needle thoroughly purified by heat. During the whole experiment the field of operation was irrigated with sublimate solution. It was found that abscesses did at times, but not invariably, appear as a result of these injections. Plate cultures invariably showed that these abscesses contained microorganisms, though both cover-glass preparations and test-tube cultures failed to demonstrate them. The development of microorganisms was explained by the theory that by constant licking the dogs infected the needle puncture.

TREPHINING FOR BRAIN TUMOR.

The following case is reported by FISCHER (*Wien. medicin. Presse*, No. 25, 1889). Patient, æt. thirty-seven, suffered in 1887 from the first symptoms of brain tumor. There was an epileptic attack with subsequent monobrachial paresis and disturbance of sensibility. On examination some aphasia was detected, together with sluggishness of the left pupil. The patient was trephined, but no trace of cerebral tumor could be found; nevertheless, there was great improvement in all the symptoms, which was, however, only temporary. Five months later, at the earnest solicitation of the patient, he was again trephined and a tumor was found involving the ascending frontal convolution. This was shelled out by the finger of the operator, and the cavity was tamponed with iodoform. There was prompt healing. Two months later the symptoms of cephalalgia and paresis returned, and the patient died in coma. The recidivity had taken place not from the brain substance, but from a portion of the growth which had not been removed from the dura. The tumor was a round-celled sarcoma.

In view of the uncertainty of diagnosis and the relief which in certain cases operation can afford to the patient, Horsley advises, in all instances, an exploratory opening of the cranium. In Jacksonian epilepsy this is also to be commended, while even in idiopathic epilepsy the segment of the skull

from which the trouble seems to originate has been removed with a subsequent amelioration of all symptoms.

CERVICAL AËROCELE.

PETIT (*Revue de Chirurgie*, No. 6, 1889) considers briefly, but very thoroughly, the etiology, symptomatology, and treatment of what are variously called aëroceles, bronchoceles, laryngoceles, and tracheoceles. Some forty-two cases are reported, and the author decidedly takes issue with Gayet's dictum, "The surgical treatment is worse than the disease." In regard to prognosis, these affections are arranged as follows:

1. Aëroceles caused suddenly by effort, as in case of a cough or during labor. In these cases, since the cause is mostly temporary, the disease may readily effect its own cure.

2. Aëroceles produced suddenly by great and repeated muscular effort, as in case of chronic chest affections accompanied by violent cough. In these cases there is no tendency to cure. Compression may arrest but cannot cure the affection.

3. Aëroceles due to ulceration or lesion of the air-passages. Some are cured when the original lesion is repaired, others have little tendency toward recovery.

In certain cases the prognosis of aërocele may be exceedingly grave, quite independently of the causative lesion or defect. There are, in these cases, sudden and repeated attacks of dyspnœa, due probably to pressure upon the recurrent laryngeal nerve.

The treatment consists in remedying the primitive and causative defect, in combating the pressure effects of the tumor, preventing its growth, endeavoring to cure it, and providing against its recurrence.

As far as operative procedure is concerned, an incision should first be made which gives sufficient room for thorough exploration; the tumor should then be opened and the orifice of communication found. This should be carefully closed, its surfaces having been first freshened, the walls of the cavity should be dissected out, and the whole wound should be tightly approximated by deep and superficial sutures.

Petit's conclusions are:

1. The predisposing causes for gaseous tumors of the neck are the anatomy of the parts, anomalies of this region, pathological conditions, and traumas.

2. The exciting cause is usually muscular action.

3. These tumors exist either as a hernia of the mucous membrane, or simply as a space or cavity in the cellular tissue of the neck. They are, consequently, either without lining walls, properly speaking, or are circumscribed by a mucous membrane, or a structure resembling that which circumscribes cysts.

4. Clinically regarded, these tumors either develop immediately to full size, or after sudden appearance slowly enlarge, or grow steadily from their first appearance.

5. These tumors can be cured by compression and the administration of narcotics, or, that failing, by operation.

6. Tracheotomy is indicated where there are attacks of sudden, violent, and dangerous dyspnoea.

RESECTION OF THE LIVER.

BOGGI (*Wiener med. Presse*, No. 21, 1889) has been successful in resecting a portion of the liver. The history of the case is as follows: A woman entered the hospital with a tumor in the right hypochondriac region. Loops of intestine overlay the tumor. A double echinococcus cyst was diagnosed. On operating, two enormous echinococcus sacs were found, the one placed superficially in front, the other lying deep and behind. The tumors, which weighed three pounds, were enucleated. Since approximation of the edges of the huge wound was not possible, a portion of the liver parenchyma three inches long was resected. The bleeding was stopped by catgut sutures. The edges of the cavity in the liver were secured in the belly wound. On account of the escape of gall from the liver the dressings required frequent changing at first. This secretion gradually disappeared and healing was quickly accomplished. A microscopic examination of the resected portion of liver showed that the lumina of the bile canals in the region of the cysts were patulous. This demonstrates the risk of leaving the fresh liver surfaces, after excision of the cyst, free in the peritoneal cavity. As was done in this case, the edges of the liver wound should be secured in the opening of the abdominal parietes.

Ceccherelli observes that, according to experiments upon animals, only a certain amount of liver substance can be removed. If more than one-third is resected, life can no longer be preserved.

Postemski has found that the peritoneal cavity of a dog withstands a certain amount of gall, but if the flow is continued a fatal non-septic peritonitis is set up.

In regard to the question of hemorrhage from the liver, Babacci strongly insists upon careful approximation of the bleeding surfaces. Experiments have shown that while the thermo-cautery is efficient when the livers of small animals are wounded, it is by no means to be relied upon in the case of larger animals. The approximation of fresh liver surfaces after excision of a portion of the organ is best accomplished by the elastic suture which has been soaked in five per cent. carbolic solution. This suture supports the parts very satisfactorily, completely fills the needle punctures, and is especially valuable in this location because the liver is constantly subject to changes in volume.

SUTURE OF THE INTESTINES.

Two interesting cases of intestinal suture are recorded by ALSBERG (*Deutsch. med. Woch.*, No. 26, 1889). In the first case a decrepit woman, aged seventy-four, inflicted a razor wound upon herself. She was brought to the hospital one hour later, perfectly conscious, exhibiting no signs of shock, but with a weak and irregular pulse. In the upper part of the belly was a penetrating wound eight inches long, running parallel to the right costal arch and about an inch below it. From the wound protruded the omentum and a large mass of intestines, one loop of which was cut transversely through two-thirds of its circumference. This wound was placed in the cæcum, just opposite the ileo-

cæcal valve. The belly walls and surrounding parts were only slightly soiled by feces. After careful disinfection the bowel wound was closed by the customary silk double suture, the first series being interrupted, the second continuous. An inch below the first wound a second was found, so small that it allowed only a slight prolapse of the mucous membrane; this was also closed by a double line of sutures. That the peritoneal cavity might be thoroughly explored, the original wound was enlarged by a longitudinal incision extending to Poupart's ligament. No trace of feculent extravasation was found. On the under surface of the liver there was a small, oblique, actively bleeding wound, the hemorrhage from which was controlled by ligature. Bowel and omentum were then replaced, and the parietal opening sutured. Dressing: iodoform gauze and moss pillow. Flatus after thirty-six hours; spontaneous defecation on the fourth day. Twenty-five days later death. Abdominal cavity aseptic; seat of bowel suture so absolutely healed that it could scarcely be found. Exitus due to heart failure.

In the next case the gut was sutured after resection of a cancer of the descending colon. The patient, aged twenty-nine years, gave a history of perfect health up to fourteen days before, when he fell upon his left hip. Dry tongue, fever. Directly over the left anterior superior spinous process of the ilium a red, tender, fluctuating swelling, the size of a man's fist. Acute osteomyelitis and periostitis were diagnosticated, and the abscess was evacuated by a free incision. On careful exploration roughened bone could be felt. All symptoms of septic absorption disappeared, and the patient was sent home with a small fistula, the healing of which he was told would necessitate another operation. A month later he returned for this operation. The fistula discharged only a small quantity of thin pus. A most striking fact was that the iliac swelling had not decreased; on the contrary, there was a progressive growth in a backward direction toward the region of the kidney. This circumstance at once suggested a neoplasm, the existence of which was confirmed by exploration through the first incision. Extirpation was decided upon. The mass was readily freed from the ilium, when it was found to involve the descending colon. The gut was ligated above and below the tumor, and the latter was extirpated, together with some enlarged glands of the mesocolon. The free ends of the cut bowel were immediately approximated by circular sutures of silk placed in three rows. The peritoneal cavity was carefully disinfected, and, after partial closure of the parietal opening, the seat of intestinal suture was secured in the wound by a strip of iodoform gauze passed around the bowel. The parietal wound was tamponaded and the dressing was completed by iodoform gauze and a moss pillow. No fever, no sign of peritonitis; flatus the second day; abundant passage of feces on the sixth day. Second change of dressing on the fifth day, when the strip of gauze holding the gut in the wound was removed. On the eighth day feces discharged into the wound, through a small perforation four-fifths of an inch above the suture line. This perforation rapidly increased in size, so that a præternatural anus was formed in a few weeks. At the same time there was some recidivity of the malignant growth along the tract of the former fistula. This was carefully removed, together with a portion of the ileum which was involved. The edges of the bowel perforation were freshened and approximated by silk sutures, which held for ten days, after which perforation again occurred and

nearly all the feces were passed through the abdominal opening. A month later the bowel was freed as much as possible, and the edges of the opening united transversely, after which the whole wound was covered in by a flap transplanted from the anterior abdominal wall. In two days some feces were found in the dressing, in spite of which nearly the whole flap healed by primary intention. Shortly feces were passed abundantly through the fistula, but soon this discharge began to diminish, till the patient required cleansing but twice a day, and passed naturally a large evacuation every morning.

Lately there has practically been no feculent discharge from the fistula, only a small quantity of pus appearing on the dressing. About seven inches of gut were resected together with the tumor, which was shown, by microscopic examination, to be a cylindrical-celled epithelioma.

The perforation after the first operation was, in this case, due to the sharp bending of the gut caused by fastening it in the wound by the strip of gauze placed about it. This flexure checked the passage of feces, and this produced sufficient interference with nutrition to determine an ulceration of the bowel. It might be safe in these cases to sink the line of suture into the peritoneal cavity.

EXTIRPATION OF THE CÆCUM.

DURANTE (*Wiener med. Presse*, No. 21, 1889) reports a successful case of extirpation of the cæcum; being the third of its kind on record.

The patient, æt. fifty-six, suffered for twelve years from attacks of colic and vomiting. In the last year she experienced such extreme pain that she demanded relief at the hands of the surgeon. In the lower right side of the belly there was a slightly movable tumor, the size and form of a large citron, irregular in surface, and apparently dense and indurated. It was diagnosticated as a carcinoma of the cæcum or of the surrounding parts.

The operation was most difficult, because of the multiple adhesions which had formed between the peritoneum, intestines, and tumor; the latter was finally extirpated, however, together with the cæcum to which it was attached, and the continuity of the gut was restored by suturing. There was no fever. The first passage by the bowels occurred seven days after the operation, and on the tenth day the patient was up and about. Section through the tumor showed that it had replaced the cæcum and vermiform appendix. Pathologically it was made up of a fibroid induration, infiltrated with tubercle bacilli.

Trombetta, in a somewhat similar case, in which there was involvement of the cæcum and ascending colon, extirpated the diseased tissue and made an artificial anus. The patient perished of peritonitis on the fifteenth day. The tumor was found to be the result of a typhlitis and perityphlitis, and was riddled with small abscesses.

TREATMENT OF URINARY FISTULÆ.

GUYON (*Revue général de Clin. et de Thérap.*, No. 23, 1889) insists upon the clinical importance of the pathological anatomy of urinary fistulæ. Dissections show that there is always a pocket surrounding the urethra, representing the region into which extravasation first took place. This pocket is lined

with an imperfectly organized, frequently fungous, granulation tissue. It is from this central, peri-urethral cavity, the primary result of urethral rupture, that the fistulæ radiate.

Clinically, patients suffering from fistulæ can be relegated to one of the following classes:

1. Those in whom the perineum is nearly normal, and who suffer from a single fistula.

2. Those in whom there is a more or less extensive tumefaction and induration, with several fistulous openings.

3. Those in whom there are multiple weeping fistulæ, with numerous indurated, irregular proliferations developed about the openings.

In the first class of cases, the normal calibre of the urethra having been restored by dilatation or internal urethrotomy, the galvanic cautery or strong tincture of iodine applied along the ulcerating tract will usually suffice for a cure, without the need of continued or intermittent catheterism.

Although it is at times possible to cure the cases coming under the second and third classifications by the same means, this is rarely accomplished. These cases should be placed in the obstetrical position, and thoroughly examined. The whole perineum is carefully palpated. If the urine contains pus and runs freely from the fistulous orifices, the existence of a central cavity is certain. If, however, urine only escapes on pressure, the passage to the urethra may be direct, and cauterization may be tried with some hope of success. In the majority of these cases, however, a formal operation is required. A median incision should be made into the perineum, and a careful dissection should be made till the central cavity is exposed. The position of the urethra should be then determined by feeling for its cord-like continuation, or by means of a sound passed from the meatus into the bladder. Then all the fistulous tracts should be laid fully open, either by cutting from within outward or the reverse. After which the fibrous walls of the central cavity are entirely removed by means of the knife or scissors. This may necessitate an enormous wound, but the surgeon need have no anxiety on this score, as it will be completely closed in by granulations.

In the treatment of urinary extravasation Guyon insists, as a means of avoiding subsequent fistulæ, upon entering the knife to the very depth of the urinary accumulation till it is in close relation with the urethra. A drainage tube should be carried to the bottom of this wound, and left in place for several weeks.

OPERATIVE TREATMENT OF INCONTINENCE OF URINE.

An ingenious and novel treatment for the cure of obstinate and persistent urinary incontinence, is described by GERSUNG (*Centralblatt für Chirurgie*, No. 25, 1889). This treatment was successfully applied in the case of a girl aged fourteen years, suffering from incontinence since birth. Examination showed a split and patulous condition of the urethra. There had been an operation performed when the patient was one year old, entirely unsuccessful in its result. In the recumbent position the urine could be retained for a short time, and voluntarily discharged, but when the patient was up and about there was a constant dribbling. At first an attempt was made to diminish

the calibre of the urethra by excising a longitudinal strip of its mucous membrane, and restoring the continuity of the canal by suture. For three days there was decided improvement, due, undoubtedly, to inflammatory swelling, but on the fourth day, and thereafter, the condition was precisely the same as before. Six weeks later Pawlik's procedure of excising a wedge-shaped piece from the surrounding connective tissue, so that subsequent cicatricial contraction should provide an elastic occluder, was suggested and carried into effect, with so much success that the urine could be retained for two hours. Five years later the patient again returned to the hospital for treatment. In the sitting posture she could retain her water for an hour, but when standing or walking, and often even while lying down, there was constant dribbling. Apparently the only thing left for this unfortunate was a complete occlusion of the urethra, together with supra-pubic puncture of the bladder and the establishment of a fistula. Before resorting to this, however, an entirely new operation was devised and successfully executed. A crucial incision was made about the external orifice of the urethra, the latter was dissected out, together with a somewhat thick layer of surrounding connective tissue, to the extent of nearly an inch, was twisted upon its long axis 180 degrees, and was then sewed in this position. Seven days later the stitches were taken out; there was some little sloughing about the urethral orifice, but the new position was maintained. There resulted decided improvement; while lying or sitting the urine could be retained several hours, but on standing there was still a constant dribbling. Three weeks later the urethra was freed for nearly a half inch of its length, twisted 90 degrees further in the same direction as before, and again sutured in this position. There was retention for two days, but after that the water could be passed voluntarily. The improvement was not marked; in the erect position the urine could not be retained more than ten minutes. A month later the urethra was freed as before, but to a greater extent, again twisted 180 degrees and secured in place by seven silk sutures. Catheterization was required for a few days. Eight days after the operation all the sutures were removed. Healing *per primam*. At first urine was passed only by means of prolonged muscular effort, ten minutes being required for each emptying of the bladder. Four months after the operation the patient experienced an urgent desire to micturate at intervals of about five hours; the water passed slowly but without muscular effort, and she remained absolutely cured of her incontinence. The particular value of the operation lies in the fact that an elastic occluder is provided which can be readily and accurately modified by a simple operative procedure. The urethral mucous membrane is thrown into spiral folds which completely close the lumen of the canal at about its middle. This operation would seem to be particularly indicated in cases in which the vesical sphincter is anatomically or physiologically wanting. For its successful termination a functional activity of the vesical detrusors would seem necessary. Yet, were this absent, its place might be supplied by manual pressure, and it is by no means certain that cases of exstrophy of the bladder, which have been operated upon successfully, might not hope for continence of urine as a result of this urethral twisting.

The operation is, of course, easier in women than in men. If attempted in the male the urethra should be divided behind the bulb, the proximal end

should be twisted, and the continuity of the tube should be restored by suture. It would be difficult to decide upon the precise amount of twisting necessary. Gersung advises that the urethra should be narrowed to the extent of opposing a slight resistance to the passage of a small catheter.

LIGATURE OF THE FEMORAL VEIN.

By a careful study of the literature bearing upon this subject MAUBRAC (*Arch. gén. de Méd.*, Jan. and Feb. 1889) endeavors to throw additional light upon the still disputed question as to the best operative treatment of wounds of the femoral vein. These cases should be grouped into two classes, namely, those in which the vein is injured in extirpation of tumors, and those in which it is accidentally cut or ruptured. In the first class of cases collateral circulation is, to a certain extent, established; indeed, the femoral vein may be completely obliterated without the appearance of the slightest œdema. The statistics of cases belonging to the first class are as follows:

1. Ligature of the femoral vein alone, twenty-one cases, with nine deaths; two of these deaths were due to septicæmia. There was no fatal issue due to gangrene.

2. Ligature of both inguinal vessels (artery and vein), ten cases. Six deaths, three from gangrene, three from septicæmia.

3. Ligature of the inguinal and deep femoral vessels. Nine cases, with a mortality of 100 per cent. Six cases died of gangrene, two of septicæmia, and one of pneumonia.

From these figures the following conclusions are drawn:

If, in the extirpation of a tumor in the inguinal region, the femoral vein is injured, both ends should be ligated. Simultaneous ligation of both femoral vessels produces a most dangerous disturbance of circulation. If the deep vessels are intact there is some hope of success, but on the first sign of gangrene amputation at the hip should be performed.

Of the cases of wound of the femoral vein suddenly and accidentally inflicted, but four instances are recorded in which the vein alone was involved. They all terminated fatally; two with and two without gangrene. Of three cases in which both femoral vein and artery were ligated, all recovered, amputation for gangrene being required, however, in two of these. Amputation for gangrene was required in three cases where, in addition to the common femoral vessels, the deep femoral artery and vein were tied; one terminated fatally. Ligature of the femoral vessels in various portions of Scarpa's triangle gave in twenty-five cases, gangrene twelve times.

From these figures Maubrac advises, in case of wound of the femoral vein, tamponade with iodoform gauze; if this fails, the vein should be secured by a double ligature, and the artery should be compressed in the inguinal region. If ligature of the artery is considered advisable, it should be performed below the origin of the profunda femoris.

In suitable cases the lateral ligation or suture is strongly commended; it is a means readily applied, requires only a moderate disturbance of surrounding connective tissue, increases the chances of healing by first intention, and preserves the lumen of the vessel intact. In four cases of lateral ligature, two were cured, two died of secondary hemorrhage and septicæmia. Three cases

of lateral suture all recovered. In four cases where the wound was closed by hæmostatic forceps, which were left in place, three died, partly from septicæmia and partly from gangrene; one of these cases was in the pre-antiseptic time.

THE OPERATIVE TREATMENT OF IRREDUCIBLE SHOULDER-JOINT LUXATION.

A critical study of the operative methods of dealing with old traumatic irreducible luxations of the shoulder-joint is contributed by BRUNS (*Beiträge zur klin. Chirurg.*, Bd. iv. Heft 2). He particularly considers the choice between restoring the humerus to its proper position and resection with division of adhesions. Ten cases of arthrotomy gave two deaths, one pseudarthrosis, three subsequent resections, and four cases of marked improvement. The outcome of two cases could not be determined. Twenty cases of shoulder-joint resection were followed by four deaths; the result in the other cases was satisfactory, in some instances exceedingly so. Reduction by formal operation would seem to be indicated only in cases of recent irreducible luxation; in old cases resection should always be preferred.

SUCCESSFUL CASE OF SPINAL RESECTION.

DAWBARN (*N. Y. Medical Journal*, June 29, 1889) reports a case of spinal resection for fracture, in which some improvement was noted after operation. The patient had a fall, lost consciousness, and on awakening was without sensation or power of motion in the parts below the ribs. Evident displacement of the spinous processes of the eleventh and twelfth dorsal vertebræ, especially the latter, which projected posteriorly. The patient was treated by braces, massage, and electricity for six months, with slight improvement at first, later muscular atrophy seemed progressive. Operation was decided upon, and with the idea of replacing the detached portions of the column an H-shaped incision was made, the long arms running on either side of the middle line of the back. After section through the laminæ the latter could be raised from the cord with the flaps, thus preserving muscular and fibrous attachments and insuring the preservation of the vitality of the bone. The right eleventh lamina was crushed below the level of its fellows and was so firmly adherent to the theca that its removal was a difficult matter. The cord being freely exposed was found to form a distinct angle projecting backward. There had evidently been a fracture of the body of the twelfth dorsal, which had been thrown backward. To free the cord from any possible pressure the posterior arches of the tenth, eleventh, and twelfth dorsal vertebræ were removed. The patient's condition requiring immediate termination of the operation, the theca was not opened. Antiseptic dressing. Completed by a plaster jacket. Much pain afterward; relieved by trapping the plaster. Wound healed *per primam*. There has been marked improvement (ten weeks) in his condition since operation. Muscular reaction to electricity is better, there is no longer pain on motion. The bladder and rectum begin to show some evidence of returning control, and the temperature of his legs has become normal, or nearly so. The writer concludes from this case and a study of others on record, that:

"Whenever, following traumatism, even a slight abrupt irregularity of the spinal column is observed to coexist with paraplegia from this level, a cutting operation is indicated to determine whether the paralysis is not, by bony pressure, made incapable of spontaneous relief. This operation should be deferred no longer than recovery from the original shock of the injury demands. If needed at all, it is needed early; and we make a mistake if, as in my case, we wait until electricity and time have alike proved futile before attempting what I may call exploratory resection. It will be the easier by far to the surgeon at this early stage, and the safer for the patient; at least when the obvious displacement is due to a broken posterior arch, as then comparatively little bony section would be needed, the fragments not having become consolidated by bony union in their false position."

OTOLOGY.

UNDER THE CHARGE OF

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MENTHOL IN FURUNCULOSIS OF THE EXTERNAL AUDITORY CANAL.

DR. R. CHOLEWA, of Berlin, has treated successfully furunculosis in the ear by means of a twenty per cent. solution of menthol in oil, applied on cotton tufts to the canal of the ear. This is held to be antibacterial treatment. These tampons of cotton soaked in menthol solution exercise a slight pressure on the infiltrated spot. The slight burning soon ceases, and in the place of the darting pain, come relief and sleep at night. The cotton tufts can remain twenty-four hours in place, if there is no suppuration. If suppuration occurs, the boil must be opened.

ARTIFICIAL DRUM-MEMBRANE AS A CURATIVE AGENT.

DR. H. N. SPENCER, of St. Louis, Mo., has recently contributed a paper of great value on the above-named subject (*St. Louis Polyclinic*, July, 1889). The author, in 1876, at the International Medical Congress in Philadelphia, advanced two conclusions to a paper on the use of the artificial drum-membrane, viz.: 1. "Of the various forms of artificial drum-membrane in use, the cotton pellet is preferable for its great simplicity and easier introduction, for comparative safety in its employment, and for the greater uniformity of its effect." 2. "It has an advantage over other forms of artificial drum-membrane in that to the considerations named there may be added its value as a means of treating the tympanum; and *this therapeutical use of the artificial membrane has a great future in otology.*"

The present paper considers the fulfilment of the prophecy then made.

Dr. Spencer inserts what he terms a "*dry medicated* artificial membrane, made of cotton agitated in finely powdered boric acid until the powder is thoroughly incorporated in all the interstices of the fibre. The cotton pellet thus prepared is then inserted as far as the fundus of the canal by means of the angular forceps.

It is claimed that the use of such an artificial drum-membrane favors the growth of a new membrane. It may be used even when the ear is discharging, as it tends to check the latter. Two cases are cited in which the hearing was improved, and the condition of the ear greatly benefited by this means of treatment.

THREE CASES OF AURAL POLYPUS IN WHICH THE NEOPLASM WAS OF GREAT SIZE, AND PRODUCED SERIOUS CONSTITUTIONAL SYMPTOMS.

DR. R. W. SEISS, of Philadelphia, contributes a paper with the above title in a recent number of the *University Medical Magazine*, July, 1889. In the first case, a woman, twenty-one years old, was affected with epileptiform seizures from the presence of a large polypus, extending from the drum to beyond the meatus externus. As soon as this peripheral irritation was removed the woman recovered.

In the second case, a man, twenty-three years old, was found to have complete paresis of the facial nerve, marked vertigo, weakness, and pallor. Examination revealed a large rugous polypus in the ear of the affected side. In the course of five or six weeks after removal of the polyp and antiseptic treatment of the ear, the paresis had disappeared, and the general health greatly improved.

In a third case, that of a man twenty-one years old, there had been a slight bloody discharge from the right ear for eight years, recently there had been pain. The patient had been weak, easily nauseated, and faint. A large, tough, mulberry-like polypus projected from the meatus; upon its removal the man's condition immediately improved.

THIRTEEN CASES OF CHRONIC PURULENT OTITIS MEDIA, TREATED BY EXCISION OF THE AUDITORY OSSICLES; WITH REMARKS.

DR. C. J. COLLES, of New York, has published an article with the above-named title in a recent number of the *Deutsche med. Wochenschrift* (No. 28, 1889).

After observing that the usual local treatment for chronic otorrhœa in many cases fails to bring about a cure, because the disease lying in the ossicles which have become necrotic, and the latter being held in the drum-cavity by synechial bands and the remnants of the membrana tympani and the normal ligaments of the ossicles, drainage is interfered with, and the diseased elements retained in the cavity of the attic. It has, therefore, become apparent to aurists that these diseased tissues, which prolong the suppuration, must be removed by excision if a radical cure is to be obtained. Hence, Schwartz, Kessel, and others in Germany, and Sexton, in this country, have practised excision of the remnants of the ossicles and the membrana tympani in cases of obstinate purulent otitis media.

Dr. Sexton, in a recent work on the ear, gives an account of excision of these diseased remnants in twenty-nine cases of chronic purulent otitis media, which had defied all forms of the usual routine treatment for chronic otorrhœa.

The operation is performed by him under ether, and the illumination of the ear, in which a light must be brought near the organ, is accomplished by means of an electric lamp held on the forehead by a head-band, like that of the forehead mirror, and supplied from a small portable storage battery.

Dr. Colles adds the notes of thirteen cases of this operation for the cure of chronic purulency of the ear, occurring in Dr. Sexton's practice.

The results were eight cures, and five cases much improved in hearing, and in obtaining freedom from attacks of earache, tinnitus, and vertigo. The ages of the patients varied from four years to forty-two years.

We wish that more were said as to the after-treatment, if there was any, carried out in these cases, but not a word is said as to the detail of operation, nor what course of treatment or hygiene was pursued. In our experience with this operation, the results are best where at least a mild antiseptic after-treatment has been observed. This may be no more pretentious than keeping the meatus hermetically plugged for some days, or until cicatrization sets in, with cotton impregnated with boric acid or iodoform. In our opinion, in many cases, this operation is the only method of obtaining a cure of the chronic suppuration. When we consider how important to health and life a cure of chronic suppuration of any part of the middle ear is, this operation is worthy of all attention and the most careful elaboration on the part of aurists.

ELECTROLYSIS IN CHRONIC SUPPURATION OF THE MIDDLE EAR.

GRUBER, of Vienna, has applied Voltolini's method of electrolysis in the cure of nasal polypi, to granulations and polypi in the ear (*Wiener med. Blätter*, No. 8, 1889). He concludes that electrolysis easily causes granulation and polypi in the ear quickly to disappear. The effect is the prompter, the stronger the current and the longer it can be endured by the patient. But it is usually a painful process. Polypi as large as peas were made to disappear, after one application of electricity, in thirteen days. In some cases, however, small granulations required longer treatment. The otorrhœa did not always cease with the disappearance of the polypi. The method is so painful that it is advised only when no instrument can be used. We must say we have never met a granulation or polyp so small as not to permit snaring or hooking off.

Two methods have been employed; one in which the kathode is placed on the mastoid while the anode is placed as deeply as possible in the growth. In the other method, both poles are armed with needles, which are separated from 1 to 2 mm., and are then both placed in the growth. In both cases a current from ten elements of a Siemens and Halske's battery was employed, and this was endured not more than two minutes by any patient.

MICROÖRGANISMS IN THE SECRETIONS OF OTITIS MEDIA ACUTA.

During the past two years, DR. E. ZAUFAL, of Prague, has been publishing his researches among the microörganisms found in the secretion of acute

purulent otitis (*Präger med. Wochenschr.*, July 6, 1887; *ibid.*, 1888, Nos. 20, 21, and 45; *ibid.*, 1889, Nos. 6, 12, and 15).

The author lays before him three cardinal questions, viz.:

1. Which microorganisms are found in the secretion of acute purulent inflammation of the middle ear?

2. Are such microorganisms found in the tissue of the inflamed mucous membrane of the tympanic cavity?

3. Is it possible to produce otitis media by artificial inoculation of the pure cultures of the microorganisms concerned?

The investigator took the material by paracentesis from otherwise healthy individuals, affected only with acute rhinitis, pharyngitis, ozæna, or bronchitis, but who had *no pneumonia*. The matter thus obtained was divided into two groups, in the bacteriological examinations. There was found in the sero-sanguinolent secretion the capsule-bacillus of Friedländer, and in the sero-purulent secretion the pneumo-diplococcus of A. Fränkel, as pure cultures. Both can cause croupous pneumonia. The former is found in the nasal secretion in acute coryza, and the latter may be found in normal saliva. The microbes can pass up the Eustachian tube into the middle ear and cause otitis media; especially when the mucous membrane of the tube and middle ear are rendered a propitious soil by colds in the head. Three conclusions are then formulated, as follows:

1. The normal tympanic cavity of animals (rabbits) is, as a rule, not free from germs. Though few in number they are capable of development.

2. The mechanism of the Eustachian tube is sufficient, in normal circumstances, to prohibit the passage of numerous germs into the drum-cavity. Yet it is never in so perfect a condition as to prohibit entirely the passage of some germs.

3. From the entrance of the nose to the tubal openings and the drum-cavities, the number of germs rapidly diminishes. While the number at the mouth of the tube may be considerable, the number in the drum-cavity is reduced to a minimum.

The author describes four forms of infection:

1. Auto-infection, in which "dormant" pathogenic germs begin to grow and penetrate the tissue, through nutrient changes in the mucous membrane.

2. Infection by mechanical action of the Eustachian tube, by which microbes in the nasal secretions are forced into the drum cavity in large numbers and full virulence.

3. Infection in which the microorganisms which have grown in the tissue of the naso-pharynx, invade the mucous membrane of the drum-cavity, by way of the lymphatics and bloodvessels of the submucosa and the mucous membrane of the Eustachian tube.

4. Hæmatogenous infection, which, however, according to Trautmann, occurs only in acute endocarditis.

THE EFFECTS OF THE DISCHARGE OF FIRE-ARMS UPON THE EAR.

H. NIMIER, Surgeon-major, has formed some conclusions on this topic which are published in the *Archives de Médecine et de Pharmacie militaires* (No. 7, July, 1889), as follow:

1. The detonation caused by the discharge of fire-arms is a complex noise caused by: *a*, the vibrations of the barrel of the piece, excited by the passage of the projectile; *b*, those resulting from the transmission of movement to the accessory parts of the weapon and to neighboring objects; *c*, those excited in the projectile itself at the moment of its leaving the barrel of the piece, in which it has been rubbed; *d*, and, finally, the actual waves of sound, caused both by the projectile in its passage and by the gases due to the deflagration of the charge.

2. The effect of the discharge of fire-arms upon the ear results, in most cases, not from the shock of the explosion of gases, but from the action of sonorous waves transmitted to the membrana tympani and all of the acoustic apparatus.

3. The popular practice of looking toward the mouth of the cannon, of slightly separating the jaws and lips at the time of the discharge, as well as the want of confidence in the utility of a tampon of cotton in the ears, are in accordance with the views of the author.

4. The discharge of fire-arms can produce, beside rupture of the membrana tympani, deafness and subjective noises and various functional disturbances of a reflex nature, especially in the sphere of the bulbar nerves.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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CHRONIC CATARRH OF THE NASOPHARYNGEAL CAVITY AND THE BURSA PHARYNGEA.

In an excellent paper read before the Medical Society of Basel, F. SIEBENMANN shows (*Corresp. Bl. f. Schweizer Arzt*, June 15, 1889) that he is one of the few who have acquired a correct conception of the long misunderstood nasopharyngeal catarrh. His literary studies of the lymphoid nodular mass known as the pharyngeal tonsil, the earliest description of which he credits to C. Schneider in 1655, have been supplemented by a series of careful dissections of the region in subjects of all ages and in the fœtus; the details of which we commend to the perusal of those interested. He duly recognizes and confirms the often unacknowledged clinical and pathological studies of Wendt, who, years ago, published much that has been claimed as of entirely recent acquisition.

With Ganghofner, Schwabach, and others, Siebenmann denies the existence of a pharyngeal bursa in the sense taken by Mayer, Luschka, and others; he attributes the morbid secretions of catarrh to the entire surface of the lymphoid mass instead of being confined to its median fissure or recess; he has found

cystic formations in more than one-third of the cases he has examined; he treats even moderate cases of hypertrophy by shaving them off with Gottstein's knife as he does the severe ones; and he has usually seen hypertrophic tumefactions of the turbinates and of the septum narium subside spontaneously after abscission of the diseased tonsillar mass.

BILATERAL OSSEOUS OCCLUSION OF THE CHOANÆ.

B. FRAENKEL reported an instance of this rare condition to the Laryngological Society of Berlin (*Berliner klin. Woch.*, July 8, 1889), in a patient eighteen years of age. Rhinoscopically there was some little variation from the usual condition. The septum projected posteriorly as a small free ledge for about three millimetres. The membrane was visible anteriorly, owing to atrophy of the turbinates. There was no olfaction, and but little sense of taste; sweets and bitters being recognized the best. The membrane was perforated with a trocar.

SECONDARY FIBRINOUS RHINITIS.

At the Eighth Congress for Internal Medicine, at Wiesbaden, DR. SEIFERT, of Wurzburg, reported (*Wien. klin. Woch.*, No. 87, 1889) a case and demonstrated some specimens from it. A youth, seventeen years old, applied June 25, 1888, with ichthyosis. Three weeks previously he had recovered from a pneumonia which had left him with impaired respiration, and for a few days he had been hoarse. He was quite decrepit. He exhaled a fetid odor. The pharynx and epiglottis were reddened. The larynx could not be inspected despite cocainization. The dyspnœa and hoarseness rapidly increased and a greenish-yellow deposit formed on the pharynx and could not be washed off. Then both nasal passages became occluded; a greasy secretion escaped from the nose, and eczema appeared at the orifices. The mucous membrane of the turbinate bodies and the septum was covered with a thin, efflorescent, yellowish-green deposit. On the fifth day fibrinous masses were coughed out from the bronchi. Finally, the nose became impermeable, the voice toneless, and laryngeal stridor occurred with incurvation of the epigastrium, and dysphagia. On the eighth day tracheotomy became necessary. Great masses of pseudo-membrane were removed from the pharynx. The operation produced but slight relief; collapse ensued, and the patient died twenty-four hours after the operation. Body temperature had been but slightly elevated. Membranes were found in the nose, pharynx, larynx, trachea, and bronchi. Thus, in sequence to pneumonia a fibrinous exudation had developed on the mucous membrane of the entire respiratory tract.

Colonies of cocci, but no chains, were found in the exudation and in the lymph spaces of the mucous membrane of the lower turbinate body. The condition, therefore, differed from that of diphtheria. There was a thin exudation upon intact epithelium with cellular infiltration of the submucous layer and of the epithelium.

PACHYDERMIA LARYNGIS.

DR. L. RETHI reports and illustrates (*Wiener klin. Woch.*, No. 27, 1889) a case in a railroad conductor forty-three years of age. The lesion consisted in

nearly symmetric thickenings of the vocal bands in the region of the posterior vocal processes, with central longitudinal depressions in the tumid masses. He discusses the views of Virchow and of B. Fränkel as to its pathological histology, and recognizes the difficulties in its discrimination from other lesions. The question of alcoholism and cantation advanced by Virchow as concurrent etiological factors is not broached in this paper. The main interest of the case lies in the production of the characteristic indentation while the patient was under observation.

MULTIPLE SARCOMA OF LARYNX AND TRACHEA.

PROFESSOR SCHNITZLER has reported (*Wiener klin. Woch.*, No. 23, 1889) a case in which symptoms of disease had been but a few weeks in progress. There were right-sided infiltration of the laryngeal surface of the epiglottis and marked and uniform tumefaction of the right ventricular band. This tumefaction was destroyed with the electric cautery. A tumor, larger than a hazelnut, was then discovered below the left vocal band, and subsequently a similar one in the right wall of the trachea. Microscopic inspection of fragments cut for the purpose from the infiltrated epiglottis, and the remnant of ventricular band revealed round-celled sarcoma.

A few days later deep tracheotomy was performed by Professor Frisch, who removed from the trachea five or six neoplasms varying in size from lentils to large hazelnuts. The tumors above the glottis were then entirely destroyed with the electric cautery, and the patient was regarded as cured. Professor von Frisch stated that after performing tracheotomy just above the jugular fossa and inserting a tampon canula, he split the trachea open from the cricoid cartilage. The anterior wall was free from tumors. Two growths about the size of hazelnuts were found laterally; one over the left side of the cricoid cartilage and the first ring of the trachea; the other, on the right side lower down. Still lower there was a group of five smaller growths in the neighborhood of the fifth to the seventh cartilages, rather loosely attached to the mucous membrane and in the posterior and lateral walls. All the tumors were removed by scraping, and their bases were scorched with the thermo-cautery. The canula was removed on the fourteenth day.

TUBERCULOSIS OF THE LARYNX.

In a paper read by PROFESSOR H. KRAUSE, of Berlin, before the last Congress for innere Medicin (*Therap. Monats.*, May, 1889) he summarizes the results of the treatment with frictions of lactic acid introduced by him in 1885. For a long time, he has rarely used lactic acid in stronger solution than 50 per cent.; whereas, formerly, he used it in much stronger solution, 80 per cent., and even occasionally undiluted. His experience, after four years' use of lactic acid, has remained the same as announced in his initial paper. The results are satisfactory in the majority of severe cases, sometimes remarkably prompt and happy. Some of his patients have remained cured for more than two years. In two of those who had had deep ulceration, recurring lesions did not take place for more than two years. He acknowledges that cures are not always thorough in a purely anatomical sense. He has frequently found

on post-mortem examination of patients whose larynges had shown complete cicatrization laryngoscopically, that uncicatrized ulcers were found in locations difficult of reach, such as the ventricles, and the lower cavity of the larynx. The lack of cure in these instances, however, are to be attributed to the inaccessibility of the lesion, and not to the inefficiency of the remedial agents. Curetting, as advised by Heryng, previous to the use of the lactic acid, is indicated in the presence of thick bordered ulcers and extensive infiltration.

The accessible lesions most difficult to manage and the worst in prognosis are infiltrations of the epiglottis. Swellings in the lingual surface of the epiglottis are to be combated by treating the ulcerations and infiltrations of the laryngeal surface to which they are most usually due.

In curetting, Krause now uses a double curette of his own construction, a description of which does not appear in this article. It is probably a cutting forceps.

A few typical cases are reported in some detail.

DERMATOLOGY.

UNDER THE CHARGE OF

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AND

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ON PAGET'S DISEASE OF THE NIPPLE.

Recent observations have led DARIER to believe (*British Medical Journal*, June 1, 1889) that Paget's disease is a form of cutaneous psorospermiosis. Examinations of the epidermic scales and sections of skin from the affected area, properly prepared, disclosed the presence of round bodies, which were, according to the writer's opinion, undeniably psorospermia or conidia. Similar bodies, it is well known, have been found in other cases of epithelioma. It is probable, the author states, that Paget's disease of the nipple is caused by these parasites.

TREATMENT OF PURPURA HÆMORRHAGICA BY NITRATE OF SILVER.

In the especially grave variety of purpura hæmorrhagica which POULET describes as the "asthenic" form (*Bull. générale de Thérapeutique*, May 3, 1889), he has found in a number of cases that the administration of nitrate of silver has acted as a specific, and in a surprisingly rapid manner. The notes of two of these cases are given, in which symptoms of an alarming character were

present. Other remedies had been without influence. The nitrate of silver was given in the ordinary dose, and improvement rapidly ensued. The author believes that the remedy profoundly influences the capillary circulation by its impression on the vaso-motor nerves.

TREATMENT OF NÆVI BY ELECTROLYSIS.

In some years' experience MARSHALL has reached the conclusion (*Lancet*, Jan. 12, 1889) that, upon the whole, electrolysis constitutes the best method for the removal of nævi. Its advantages are: (1) That there is no after-pain; (2) It is free from danger; (3) There is no bleeding; (4) The scar is white, and does not tend to contraction in loose structures, like the eyelids. Its main disadvantage is its slowness, for, while in exceptional instances nævi may be cured at one sitting without sloughing, it is unwise to attempt so much, as the chances are against a satisfactory result. It is better to have recourse to several such applications at intervals. The author's method consists in inserting the needle attached to the *positive* pole well under the surface of the growth, and then, after remaining in one spot long enough for some effect, to move it to other parts without withdrawing the needle. The circuit is made by attaching a rheophore to the negative pole; in this manner an unnecessary puncture is avoided. Before withdrawal of the needle it is first rotated. The orifice is painted over with collodion. A current from five to ten Leclanché cells is generally sufficient. Change in color to a dusky hue is an indication that the action has been sufficiently long continued.

AN ANOMALOUS FORM OF ECZEMA.

MAPOTHER has met with (*British Medical Journal*, January 5, 1889) several cases of apparently eczematous disease involving the tragus and hairless skin in front of it, which have borne a striking resemblance to Paget's disease of the mammary areola. He quotes Crocker as having seen a similar condition on the scrotum. These regions have some physiological analogies: in all, the sebaceous glands are very large.

The several cases here embraced were characterized by a uniform, florid, oozing surface without granulations, hard and slightly raised, but without the rolled-over edges of rodent ulcer; without pain or much itching; stubbornness to treatment, and with, after healing, a slightly depressed unpigmented cicatrix remaining.

THE TREATMENT OF HYPERTRICHOSIS.

JAMISON (A.) describes in *The Practitioner* for July, 1889, a method which he has successfully employed in removing hairy moles and excessive hair growth upon unusual parts. It consists in the application of sodium ethylate. The notes of a case in which this plan was practised are given. The patient was a child of three months, the whole right half of whose forehead was closely covered with a growth of long hair. Under chloroform, after cutting the hair short on a part of the involved area, sodium ethylate was rubbed over the cleared surface "very freely and thoroughly till the skin had an orange appearance." Cold cream was then applied. At the end of

a fortnight the result was seen, and was most gratifying. "The hair-follicles over the greater part of where the application had been made seemed destroyed, and a whitish skin remained." Other parts were from time to time treated in the same manner, and the final result was satisfactory.

ZOSTER GANGRÆNOSUS ATYPICUS.

In the *Wiener klinische Wochenschrift* of March 7, 1889, KAPOSI contributes, under the above designation, the notes of two cases of an anomalous herpetic disease. Both patients were females of a nervous temperament. The eruption occurs in patches or groups, similar to ordinary zoster, beginning usually as a somewhat elevated efflorescence, showing, in a day or two, scattered thickly over its area, subepidermic darkish or brownish points. The redness fades, and the gangrenous points rapidly involve the epiderm, and the patch then appears as a superficial, incompletely formed dry slough; or suppuration beneath the sloughing points takes place, and gives the patch the appearance of a dotted, superficial, sharply outlined erosion or ulceration. One or more patches may be present, and may be irregularly distributed. In four to eight days the disease tends to retrograde, disappearing entirely at the end of a few weeks, leaving behind, as a rule, more or less scarring with a keloidal tendency. In the one case a number of such attacks had occurred. The patches when developed suggested an artificial origin—from caustic potash or nitric acid—but when studied carefully it could be seen that the beginning of the process was subepidermal, involving primarily the corium. The disease, while unquestionably neurotic, differs from that which has been described as "herpes zoster gangrænusus" by the recurrence of the attacks, its irregular localization, and also by the fact that the eruption is not confined to one side.

TRICHOMYCOSIS NODOSA.

PATTERSON describes (*British Medical Journal*, May 25, 1889), under this name, a nodose condition of the hairs of the axillæ and scrotum, the same as that to which Paxton and Behrend had previously called attention. The hairs, while appearing dry, are not, excepting at the nodules, abnormally brittle. They feel rough and knotted, and the knotting may be either nodular or diffuse. The author considers, from his investigations, that the affection is of bacterial origin, small rod-shaped bacteria growing in the cortical layers of the shaft having been found. The hair is not deeply penetrated, nor are the follicles invaded. The writer believes that the affection has often been confounded with trichorexis nodosa.

XERODERMA PIGMENTOSUM.

The notes of a typical case of this disease, illustrated by a chromo-lithograph, are contributed by MCCALL ANDERSON in the *British Medical Journal* of June 8, 1889. The antecedent family history was good. The patient's sister, however, had been similarly affected, and had died at the age of nine of an intercurrent lung-affection. The disease in the present case, a boy aged nine, was first noticed when he was two years old. Nothing further was

noted at that time, however, than the appearance of "freckles" upon the face and neck, disappearing in the winter season, and recurring, in an increasing manner, during the summer. For the past few years other parts had been invaded, the pigmentation had become much darker, and the spots had, moreover, become permanent. In the last year small wart-like growths, telangiectases, and cicatrices had made their appearance on the face. Here and there also could be seen small atrophic areas, having a white and glazed appearance, and with a border of dilated capillaries. The growths were found to be epitheliomatous. As the author states, the true nature of this disease is as yet unknown, and treatment must be based on general principles.

GALVANISM IN THE TREATMENT OF PARASITIC SKIN DISEASES.

WESSINGER (*Journal of Cutaneous and Genito-urinary Diseases*, July, 1889) reports the cure of several cases of parasitic skin diseases by means of a parasiticide solution introduced into the invaded parts by means of the galvanic current. Among these several cases were one of favus of the scalp of eight months' standing, and one of tinea tonsurans of three months' duration; the writer states that the former was cured with six applications in six weeks, and the latter with ten applications in four weeks' time. A corrosive sublimate solution was the parasiticide employed.

[We give an abstract of this paper merely for the opportunity of stating that the same method was tried under our auspices in the Skin Dispensary of the Hospital of the University of Pennsylvania by Dr. Hartzell, in three typical cases of tinea tonsurans. This was even before Dr. Reynolds' paper on this subject had appeared. In each instance a prolonged application was made every other day, with absolutely no more progress toward cure than may be effected with the same solution without the galvanic current. The galvanic method was employed in these patients for at least six weeks and finally abandoned, and the disease eventually cured in the course of three to five months with the ordinary methods of treatment. In short, while theoretically we had hoped much from this plan, our experience with these three typical cases failed so utterly to bear out our expectations that further trial was thought unnecessary.—EDS.]

ON THE TREATMENT OF TINEA TONSURANS.

HARRISON presents in this paper (*British Medical Journal*, March 2, 1889) his method of treating tinea tonsurans. His plan is based upon the belief that the spores live and germinate within keratin tubes, and that keratin is not acted upon by most of the so-called parasiticides, and the conidia under such applications would remain undisturbed. The destruction of this keratin is effected by caustic alkalis, but these have no destroying action upon the spores. His method is, therefore, first to apply an alkali to the affected area, and then follow with a powerful parasiticide. These two actions he claims now to accomplish by a compound application: R.—Potassæ causticæ, grs. ix; acidi carbolic, grs. xxiv; lanolini, ol. cocœ, āā ℥ ss, ft. ungt. A cure is generally brought about in from one to three months.

THE TREATMENT OF PSORIASIS WITH APPLICATIONS OF HYDROXYLAMINUM MURIATE.

FABRY reports (*Archiv für Dermatologie und Syphilis*, H. 2, 1889) his experience with the hydroxylaminum in the treatment of this disease. The twenty-four cases on which the observations were made occurred in the service of Dr. Doutrelepont, of Bonn. The external use of the drug is here referred to, as its internal use has been found to have a paralyzing effect upon the nerve centres. Even its local application needs medical supervision. The remedy was applied either in alcoholic or aqueous solution, after neutralization with calcium carbonate. The strength employed varied from 1:1000 to 1:200. It is painted on the patches twice daily, and a cloth may be wetted with it and applied to suitable parts. Albumin may be occasionally found in the urine of patients so treated. Its advantages over chrysarobin and pyrogallic acid are cheapness, absence of staining, and the comparative infrequency of any irritating effect.

THE REMOVAL OF TATTOO MARKS.

In his letter to the *Journal of Cutaneous and Genito-urinary Diseases*, March, 1889, BROcq refers to the plan of treatment practised by Variot for the removal of tattoo marks. The method consists in freely painting the part with a strong tannin solution and then immediately pricking the skin with a bunch of needles in order that the tannin may penetrate deeply. The operated surface is then rubbed vigorously with nitrate of silver. The pricked points in the course of a few moments become black, and the surface is then wiped off. Varying degrees of inflammation ensue, with more or less pain on motion. In about two weeks the eschar becomes spontaneously detached, beneath which is seen a red cicatrix. In due time the redness disappears.

The statement of Dupuy that the natives of the Indian Archipelago remove tattoo marks, without leaving a scar, by making tattooings with the juice of the carica papaya, is also quoted.

OBSTETRICS.

UNDER THE CHARGE OF

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DIAGNOSTIC POINTS OF VALUE IN THE FIRST THREE MONTHS OF PREGNANCY.

LÖHLEIN (*Deutsche med. Wochenschrift*, No. 25, 1889) regards Hegar's sign, softening of the lower uterine segment, as a most valuable sign of early pregnancy. He has found the elastic, cystic feeling given by the body of the

uterus equally significant, often suggesting a bicornate uterus. This condition is present from the second half of the second month to the end of the third; it is best appreciated by bimanual examination, often *per rectum*.

Auscultation of the foetal movements is also a valuable sign, applicable three or four weeks before life is felt. In a case of small ovarian cyst with disordered menstruation and bluish vagina, he was deceived by contractions of the recti and oblique muscles.

PRACTICAL POINTS FROM SECTIONS MADE UPON WOMEN DYING IN LABOR.

BARBOUR (*Edinburgh Medical Journal*, July, 1889), from the study of frozen sections, finds that the mechanism of labor does not properly begin until the head enters the pelvic cavity. The bony pelvis is encroached upon by soft parts in the living patient at the brim, one-fifth of an inch in the conjugate; transversely, one inch; obliquely, one-quarter inch. In the pelvic cavity the conjugate is lessened two-fifths of an inch; transverse diameter, one inch; obliques, three quarters of an inch plus a reducible one-half inch. The foetal head measured—suboccipito-bregmatic diameter, four and one-quarter inches; occipito-frontal, four and one-half inches; occipito-mental, five inches: this was the unmoulded head before labor. Regarding the mechanism of labor, the foetus grows in a condition of flexion which becomes less well marked as labor proceeds.

LABOR COMPLICATED BY THE ADMINISTRATION OF ONE-FIFTH OF A GRAIN OF STRYCHNIA.

AVRARD (*Bulletin de la Société Obstétricale de Paris*, No. 6, 1889) reports the case of a primipara to whom a midwife had given strychnia aggregating one-fifth of a grain to secure vigorous pains. This result not following, a physician was called. The foetus was found to be in cephalic presentation; dilatation of the os and cervix was complete. Traction with the forceps failing, the uterus was found tetanized and very hard. A hot bath was given, belladonna ointment was applied to the os, and under chloroform the head was brought to the pelvic floor by forceps and delivered. As the cord was about the neck, the attempt to deliver the shoulders rapidly was made, but failed. Rotation was very difficult from the uterine rigidity; the child was stillborn; the mother recovered without complications. None of the usual constitutional effects of the drug were observed; pains in the legs and convulsive movements were present. The patient's subsequent labor was marked by uterine inertia requiring forceps.

A SINGULAR ERROR IN DIAGNOSTICATING A BREECH PRESENTATION.

LOVIOT (*Ibid.*) describes a case of breech presentation in a primipara forty years old, in which the os uteri, but slightly dilated, was thought to be the child's anus, as it was smeared with meconium. Dilatation was thought complete when it had scarcely begun. The child was stillborn, after a tedious labor, during which the error became apparent to the obstetricians in attendance.

THE CAUSES AND TREATMENT OF RETAINED PLACENTA.

AHLFELD (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band 16, Heft 2) considers a cause of retention of the placenta to be stricture of the cervix and lower uterine segment produced by irritability of the uterine tissues; this condition frequently follows efforts to expel the placenta by pressure. Adhesion of the placenta to the uterus is also a cause of placental retention. Such adhesion results from inflammation of the placenta (specific or septic), from maternal nephritis, and from causes as yet unknown.

Regarding treatment, the placenta should be expelled spontaneously, if possible, and care should be taken not to irritate the lower uterine segment (Ahlfeld practises the expectant method in delivering the placenta). When manual interference is necessary the hand should not be inserted in the uterus, but gentle traction should be made upon the edge of the placenta with two fingers within the cervix. The strictest precautions should be employed to keep the vagina and cervix aseptic. Ahlfeld reports thirteen cases of retained placenta, only four of which had normal puerperal periods: One died, the remainder suffered from more or less septic infection.

THE TREATMENT OF RETAINED MEMBRANES.

EBERHART (*Ibid.*) states the practice followed in Kaltenbach's Clinic at Halle in retention of the membranes. It is believed that auto-infection does not occur unless the mother suffers from a pathological process during pregnancy which produces septic matter at labor. Normally, the uterine cavity is free from germs.

Retention of membranes is dangerous only when the membranes lie in the cervix and vagina, where they readily become infected. They should be removed from the cervix and vagina by two fingers gently inserted, but the uterine cavity should not be entered. The vagina should be frequently and thoroughly doused with antiseptic solution, and ergotin should be given to secure the expulsion of fragments remaining in the uterus.

RUPTURE AND SUPPURATION OF THE PELVIC JOINTS COMPLICATING PARTURITION AND THE PUERPERAL STATE.

DÜHRSEN (*Archiv für Gynäkologie*, Band 35, Heft 1) has collected thirty-two cases of rupture and suppuration of the pelvic joints complicating parturition and the puerperal state, to which he adds another, aggregating thirty-three. The passage of a large head; violence done by forceps; and in some cases in which a pathological condition exists in the joint, the passage of very large shoulders, are most frequent causes.

Suppuration may occur in pelvic joints not ruptured during labor; it is easily overlooked, but should be searched for when fever persists without apparent cause. The causes of suppuration in the pelvic joints are metastatic (pyæmic) inflammation; infection, not necessarily septic, from a vaginal wound occurring during the puerperal state; and tuberculosis. Fever, following rupture of the joints, during the first seven days after labor, does not necessarily denote pus formation; it may be caused by absorption of unde-

composed blood exudate; long-continued fever with pain and swelling at the symphyses denote suppuration.

The treatment should invariably be incision and drainage under antiseptic precautions. Such treatment should be promptly applied before burrowing abscesses form. After incision and drainage good bony union results from the formation of a bony callus.

The prognosis of these cases was formerly regarded as most unfavorable; when they occur as complications of puerperal septicæmia they share the prognosis of that condition. Of the reported cases, 70.9 per cent. died; those in which spontaneous rupture and evacuation of the abscess occurred, or incision and drainage were practised, recovered.

Dührssen's case was that of a multipara who had had difficult labors requiring manual termination by reason of the great size of the foetal shoulders. Dührssen extracted with difficulty a large stillborn child. Suppuration and pus formation at the symphysis pubis followed; the joint was drained antiseptically. Fever continuing, a large abscess was found on the inner aspect of the thigh communicating with the first. When this was drained, prompt recovery followed.

PROLAPSE OF THE GENITAL ORGANS FOLLOWING PARTURITION.

DUPLAY and CHAPUT (*Archives Générales de Médecine*, July, 1889) conclude, from the examination of women who had borne children and suffered from prolapse of the genital organs, that the great majority of such conditions are caused by increase in the size of the vulvar orifice, with or without perineal injury. Prolapse of the anterior vaginal wall and cystocele result; the bladder becomes chronically over-distended, and drags upon the ureters, sometimes dislocating the kidneys.

By measurement it was found that prolapse of the vagina resulted when the vulvar orifice was one and a half inches in length, or when the tissues about the vulva were very elastic. An actual loss of tissue of one-fifth of an inch in the perineum favored prolapse. These observations were made upon the cadaver. Prolapse was the rule in old women. Uterine hypertrophy, alterations in the uterine ligaments and in the vagina were of secondary importance from the standpoint of an anatomical examination.

EXPERIMENTAL PUERPERAL INFECTION.

STRAUS and SANCHEZ-TOLEDO (*Nouvelles Archives d'Obstétrique et de Gynécologie*, No. 6, 1889) have experimented extensively upon animals to determine the condition of the genital tract after labor, and the circumstances attending puerperal infection. No microorganisms were found after normal labor. Cultures of the most virulent bacteria were injected into the uteri of rabbits and rats after labor, while the same cultures were injected beneath the skin of one of their young, as a control experiment. The intra-uterine experiment was without result; the subcutaneous injection was fatal. The bacillus of chicken cholera was an exception, and infected rabbits by intra-uterine injection. Histologically, the mucous membrane of the uterus in the lower animals is renewed at once after labor; this is not so in the human subject, but an open wound remains, hence the danger and frequency of infection.

SEVERE PUERPERAL INFECTION SUCCESSFULLY TREATED BY CONTINUOUS IRRIGATION.

KALINCZUK (*Prager medicinische Wochenschrift*, No. 27, 1889) reports the case of a multipara who suffered from severe septic infection after the birth of a macerated foetus. Septic endometritis and beginning peritonitis were present. The patient's temperature resisted all antipyretic drugs, while the infection became more severe; repeated intra-uterine douches failed to reduce the temperature permanently. Accordingly 20 quarts of carbolic solution of one per cent. were allowed to run through the uterus during four hours' time. In all, 115 quarts of one per cent. solution were used in five days. Stimulants and food were freely given. Recovery followed, and a double pleural exudate, which was septic in origin, gradually disappeared.

PRACTICAL ANTISEPSIS IN OBSTETRIC PRACTICE.

BOKELMANN (*Berliner klinische Wochenschrift*, No. 26, 1889) does not accept the theory of auto-infection, and considers prophylactic disinfection of the vagina irrational. The normal epithelia of the parts are fully capable of resisting the invasion of septic germs. He confines his attention to antiseptics of all which touches the patient and of her own external genitalia.

FATAL INTOXICATION WITH BICHLORIDE OF MERCURY.

LEGRAND (*Annales de Gynécologie et d'Obstétrique*, June, 1889) reports the case of a multipara who aborted with one twin, and was brought into the hospital while the other remained in the uterus. The patient was anæmic, having suffered from metrorrhagia. After a vaginal douche of bichloride of mercury 1 to 2000 an intra-uterine douche of ten quarts of bichloride 1 to 2000 was given, followed by two quarts of boracic acid 1 to 50. Three hours later the douches were repeated; during their administration the patient complained of violent abdominal pain. Uterine contractions continued, and the second twin was expelled three hours later. The douches given subsequently were vaginal only, and were bichloride of mercury 1 to 2000, carbolic acid one per cent., and boracic acid, alternately.

The patient developed typical mercurial intoxication, and died six days later. Post-mortem examination revealed on gross inspection diphtheritic enteritis and acute nephritis. On chemical examination mercury was found in the kidneys only. Microscopical examination revealed very extensive disintegration of the epithelium of the kidney; sloughing ulcers in the intestine, especially in the large bowel; translucent swelling of the liver parenchyma; desquamative parotiditis; the pancreas was remarkably intact. A celluloid intra-uterine catheter was used in the douches, the receptacle for the fluid was held thirty-nine inches above the patient's bed.

THE PROGNOSIS OF PNEUMONIA DURING PREGNANCY.

WALLICH (*Ann. de Gyn.*, June, 1889), reviewing the French literature of pneumonia during pregnancy, finds that pneumonia induces labor in one-third of all cases before the sixth month; from the sixth to the ninth month in

two-thirds of all cases. Maternal mortality varies from fifty to one hundred per cent. of recorded cases, and is generally caused by infection following abortion. Fœtal mortality was eighty per cent.

THE MECHANISM OF RESPIRATION IN THE NEWBORN.

DOHRN (*Münchener med. Wochenschrift*, No. 25, 1889) concludes from experimental studies of the respiration of the newborn that it is largely thoracic. Respiration begins above and extends downward, the function being gradually performed in its entirety. Soon after birth portions of the lung exist which are not yet inflated, a fact suggestive from a medico-legal view.

MACERATION OF THE LIVING FŒTUS.

RIBEMONT-DESSAIGNES (*Annales de Gynécologie et d'Obstétrique*, July, 1889) has observed a case in which a macerated fœtus was born living, and survived a few moments; he adds four cases seen by others. In some of them the fœtus died while passing through the vulva; in others it survived a few moments. In these cases the fœtus was large, its cellular tissue being infiltrated with serum. This œdema pitted very distinctly on pressure. The skin was pale and shining, the epidermis was raised in places by a clear opalescent lemon-colored fluid very different from the bloody serum seen after death. The exposed surface beneath these blebs was pale rose-colored, not deep red, as seen *post-mortem*. The largest blebs were upon the abdomen; they were found irregularly over the body, and were seen to be formed by the coalescing of very small vesicles. In labor they were ruptured by pressure, leaving an exposed surface.

Post-mortem examination of these bodies showed a blanched condition of the viscera; the peritoneum contained serum in abundance. These observations correct the older view that maceration occurred in the dead fœtus only.

TWO CASES OF FŒTAL MALARIA TRANSMITTED BY THE FATHER.

FELKIN (*Edinburgh Medical Journal*, June, 1889) reports two cases of fœtal malaria transmitted by the male parent. In one case near term the father had suffered severely, while the mother had never had a chill. Violent fœtal movements occurred periodically, finally inducing labor. The fœtal spleen was so large as to retard delivery. After birth the child had seven paroxysms of malarial infection, but recovered, the splenic tumor largely disappearing.

The second case was a miscarriage at seven months in a patient who had never had a chill, but whose husband suffered severely while on a voyage to the tropics. Two children born previously had paroxysms of shaking in the uterus, the survivor had enlarged spleen. *Post-mortem* examination of the seven-months fœtus showed the characteristic appearances of malarial infection.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE VALUE OF THE TAMPON IN THE DIAGNOSIS OF CHRONIC ENDOMETRITIS.

SCHULTZE (*Centralblatt für Gyn.*, May 11, 1889) urges the use of the tannin and glycerin tampon, emphasizing the fact that the purulent character of the uterine discharge, and not its amount, is the main indication of the existence of endometritis. The discharge is often so slight that the patient herself does not notice it, yet it is readily appreciated on the removal of a tampon which has lain in contact with the cervix for twenty-four or forty-eight hours. After practising this method daily for twelve years the writer can testify to its great practical value.

TUBERCULOSIS OF THE GENITAL TRACT.

BARBIER (*Gaz. Méd.*, 1888, No. 39) believes that a woman can be infected by a tuberculous man during coitus. Bacilli have been demonstrated in the semen, as well as in the discharge attending tuberculous epididymitis. The uterus may be infected by extension from a tuberculous growth on the vulva, without any intermediate trace of infection in the vagina. The writer even admits the possibility that tuberculous infection may be transmitted by the finger of the attendant, by unclean instruments, or even through the medium of the air.

LIGATION OF THE ARTERIES SUPPLYING THE UTERUS.

GUBAROFF (*Centralblatt für Chirurgie*, No. 22) recommends this bold procedure in cases of inoperable cancer attended with severe hemorrhage, intra-ligamentous tumors, and subserous myomata, and for the relief of metrorrhagia of unknown origin which resists all ordinary treatment. The technique is as follows: An incision is made as in ligation of the common iliac, the lower angle of the wound being at the internal ring. When the peritoneum is reached it is stripped upward from the iliac fossa and the point of division of the common iliac is sought for. The peritoneum is drawn inward with a Sims's speculum until the internal iliac is exposed; the latter artery is then followed downward into the pelvis until the uterine is reached, the ureter being the guide to it at the point where the latter duct crosses the artery. The ovarian artery may also be readily found, isolated, and ligated. The artery supplying the round ligament will be identified at the lower angle of the wound as it enters the canal with the cord, but as it is difficult to separate and tie it, it is better to ligate the inferior epigastric, of which it is a branch.

[This operation must strike the surgical reader as not only too heroic for a mere palliative measure, but as unscientific. It is certainly unjustifiable to

subject a patient, reduced by advanced carcinoma, to such an operation, and in cases of uterine hemorrhage from other causes in which radical treatment is indicated, it would seem more rational to open the abdomen and remove the whole or a portion of the uterus, previously ligating the vessels within the broad ligaments according to Stimson's method.—ED.]

REMOVAL OF AN UNSUSPECTED EXTRA-UTERINE PREGNANCY AFTER INCISION OF A RETRO-UTERINE HÆMATOCELE.

ROSE (*Deutsche med. Wochenschrift*, June 13, 1889) reports the case of a woman who had been married for ten years and remained sterile. She had menstruated three weeks before she came to the hospital, and was excessively anæmic at the time of entrance. On vaginal examination a hard tumor was felt filling Douglas's pouch and compressing the rectum and vagina. There was a soft spot at its most dependent portion, and the patient showed evidences of commencing peritonitis. An incision was made through the fornix vaginæ into the mass, and a quantity of old coagula was removed, in the midst of which was found a fœtus as long as the finger. The patient succumbed, and at the autopsy a ruptured ectopic sac was found.

[This case illustrates very forcibly the remote danger incurred by a patient who may recover from the immediate results of a ruptured tubal pregnancy. In a similar case, occurring in the Editor's practice, with an equally negative history, the diagnosis was cleared up by the discharge of fœtal bones through a fistulous opening in the vaginal roof, the patient making a perfect recovery.—ED.]

THE BEST MATERIAL FOR INTRA-PERITONEAL SUTURES.

THOMSON, of Dorpat (*Centralblatt für Gynäkologie*, June 15, 1889), reports the result of a series of interesting experiments upon animals, made with the view of determining what material is least irritating when introduced into the peritoneal cavity in the form of sutures, especially in the operation of Cæsarean section.

The sutures were prepared in the following manner: Silkworm-gut was dipped in a solution of bichloride, 1 to 1000, immediately before being used, the silk being boiled for an hour in the same solution and then kept in absolute alcohol or a five-per-cent. solution of carbolic acid. The chromicized catgut was prepared according to Leopold's method, the raw gut being soaked for forty-eight hours in a ten-per-cent. solution of carbolyzed glycerine, then for five hours in a one-half-per-cent. solution of chromic acid, and finally immersed in absolute alcohol. The carbolyzed catgut was first treated with a strong sublimate solution, and then immersed in carbolyzed oil (twenty per cent.). In every instance the suture was placed in a five-per-cent. solution of carbolic acid immediately before it was used.

The sterilization of the sutures was proved by introducing portions of them into gelatin; chromicized and carbolyzed catgut caused clouding of the gelatin in a few cases, especially when the carbolyzed gut was frayed out, showing that its deeper portions were not aseptic. The latter fact was of importance as bearing upon the question of late infection from sutures after the strands have become separated through softening. No cultures were obtained from the prepared

silk. Ordinary raw catgut caused liquefaction of the gelatin within thirty-six hours. Rabbits, cats, and dogs were made the subjects of the experiments, which consisted in opening the abdomen, making incisions in the fundus uteri, and closing them with the various sutures above mentioned; sutures were also inserted in the omentum and in the wound in the peritoneum. The sutures were left *in situ* for various periods, when the animals were killed and their abdomens was reopened. It was found that the carbolized catgut was partially absorbed at the end of ten days, and completely at the end of seventeen; the chromicized and silkworm-gut was intact at the expiration of sixty-four days, the former being more or less encysted. The silk sutures were unchanged after remaining in *situ* for two weeks, but were almost entirely absorbed at the end of nine weeks. No difference was observed in the condition of the uterine and peritoneal sutures.

The deductions from these experiments are: 1. Silk is the best material for sutures, because it can be absolutely sterilized and is eventually absorbed. 2. Chromicized catgut, silkworm-gut, and silver wire, not being absorbed, are unsuitable for intraperitoneal or uterine sutures. 3. Catgut, however prepared, should be rejected on account of its liability to carry infection; carbolized gut should not be used to close large peritoneal wounds, because it is absorbed too quickly.

HÆMATOSALPINX.

At a recent meeting of the Berlin Obstetrical and Gynecological Society (*Centralblatt für Gynäkologie*, No. 24), PAUL RUGE presented a specimen of hæmatoma of the Fallopian tube, which before operation was supposed to be an ectopic gestation, as the patient presented the symptoms and physical signs characteristic of that condition. It was carefully examined by Carl Ruge, who held that it was not an extra-uterine pregnancy. An interesting discussion followed, Veit claiming that the absence of chorionic villi did not militate against the diagnosis of pregnancy, while the fact that the blood-clot was adherent at a single point on the wall of the tube was in favor of the same. He had operated twelve times for extra-uterine pregnancy, and in three of these cases the patient had a return of the trouble in the opposite tube. Ruge said that he had found no microscopical appearances that justified him in regarding the specimen anatomically as other than one of hæmatosalpinx. Dührssen affirmed that he had seen similar effusions of blood into the tube as the result of the injudicious practice of massage, when there was no possibility of the condition being extra-uterine pregnancy.

PARTIAL REMOVAL OF THE OVARIES AND TUBES.

A. MARTIN (Volkmann's *Sammlung klinischer Vorträge*, No. 343) credits Schroeder with the first attempt to remove only the diseased portion of an ovary, leaving the healthy part. Martin has practised the same operation and has extended it to the removal of portions of the tubes. Of ten cases of partial extirpation of the ovary, conception subsequently took place in thirty per cent. In seven cases the adherent, but otherwise healthy, tube was freed from its adhesions, and the patency of the lumen having been demonstrated, the infundibulum was brought in contact with the corresponding ovary so

as to insure the passage of the ova into the tube. All the seventeen patients recovered.

The writer summarizes as follows:

1. Partial removal of diseased portions of the ovary does not affect recovery from the operation.
2. Excision of the closed, or otherwise diseased portion of the tube does not affect the healing process.
3. Women who have suffered such partial removal of the adnexa are no more liable to an extension of the disease to the healthy portion of the resected organs than are women whose ovaries and tubes are normal.
4. In all these cases of excision menstruation persists and conception is possible.

PELVIC MASSAGE.

Papers on this subject were read by BORIAKOWSKI, HALBERSTAMM, and SEMIAMKOFF at the third meeting of the Russian Medical Congress (*Wratsch*, No. 2, 1889). The first-named writer has found that massage is most valuable in promoting the disappearance of extra-peritoneal exudates; his results in cases of intra-peritoneal exudations have been less positive. He does not believe that massage will take the place of the ordinary methods of treating prolapsus uteri.

HALBERSTAMM's observations in twenty-one cases have led him to the following conclusions: 1. Subacute and chronic parametric exudates become absorbed more rapidly under the massage treatment than with any other method; peritonitic adhesions, which rarely contain much firm cicatricial tissue, readily stretch under the manipulations; 2. Prolapse of the uterus is relieved by reducing its weight by massage and then strengthening the relaxed ligaments by systematic elevation of the organ; 3. Retroversion or flexion of the uterus, without fixation, may be successfully treated by massage, provided the uterine ligaments still contain muscular fibres.

SEMIAMKOFF's observations were made in Slavjansky's clinic, twenty-eight patients being treated during the course of seven months. He met with greatest success in applying massage to old peri-uterine adhesions, although retroflexion of the uterus was not cured. In the majority of the cases in which massage was practised at the time of the menstrual flow dysmenorrhœa was either cured or considerably relieved. The writer recommends the treatment enthusiastically, and has never observed any bad results from it, even in cases of subacute inflammation where the evening temperature was 101° (!). Massage, he says, is successful in sixty per cent. of the cases, and is preferable to all other non-surgical methods of treatment by reason of its beneficial effect upon the general nutrition, as well as the local lesion.

THE FLAP-SPLITTING OPERATION FOR LACERATED PERINEUM.

MUNDÉ's practical paper on this subject, with its admirable illustrations (*Amer. Journ. of Obstetrics*, July, 1889), will serve to render this operation more intelligible to American readers than it has been hitherto. He uses sutures of silkworm-gut, introducing them through the skin at the edges of the wound, instead of just within its margin, as Tait directs. The bowels are

moved on the third day, the patient being allowed to pass her urine. The advantages of the operation, which is applicable equally to complete and incomplete lacerations, are: Celerity, simplicity, greater certainty of success in cases of complete laceration, and the fact that no tissue is removed, so that in the event of failure the patient's condition is as good as it was before. Since neither the vaginal nor the rectal mucosa is punctured, there is less liability to the formation of a fistula than in either of the old operations.

The important caution is added that the flap-splitting operation is not adapted to cases in which there is extensive rectocele.

[This brief paper deserves careful study, since we have previously had but a hazy idea of the operation which it so lucidly describes.—ED.]

INTRA-UTERINE THERAPEUTICS.

MARY PUTNAM JACOBI, in the same journal, concludes an elaborate paper on this subject, her deductions being as follows: Cauterization of the endometrium is really a sort of counter-irritation, since it causes dilatation of the bloodvessels at a point distant from the seat of irritation. Hence intra-uterine applications may modify the circulation and innervation of the perit-uterine tissues, and are dangerous according to the amount of existing hyperæmia in those tissues. This is especially noticeable in cases in which intra-uterine medication is practised just before or after the menstrual period. The post-menstrual week is the period of danger. Not more than *one* intra-uterine application should be made in the month, until tolerance has been established, and as many as *three* only in exceptional cases.

Intra-uterine medication should be regarded in the same light as a minor gynecological operation, hence applications to the corporeal endometrium ought usually to be made at the patient's house, the woman remaining in bed "from six hours to six days (!), according to the severity of the reaction." Dilatation of the canal with steel instruments is advisable if it is not readily pervious. With regard to the choice of medicaments, the writer thus summarizes: "When it is desired to obtain the remote effect on the parenchymatous circulation of the uterus which results from cauterization of the endometrium, iodine tincture or iodized phenol is required. When a superficial action is required on abraded hyperæmic surfaces, or on ulcers with papillary granulations, iodoform is preferable."

[While we would not question the theoretical deductions of such a careful observer as Dr. Jacobi, we cannot avoid calling attention to the fact that many gynecologists of wide clinical experience will differ from her with regard to the serious effects of intra-uterine medication as employed in ordinary office practice.—ED.]

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THE STERILIZATION OF FECES.¹

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THE purpose of the experiments stated in this paper is: first, to determine whether corrosive sublimate is a good disinfectant for feces, and if it is not, whether this is due to the formation of inert, insoluble compounds of mercury with the feces; second, to determine the relative value of certain other disinfectants used for this purpose.

The only sure method to determine the value of corrosive sublimate for disinfecting feces is to mix it with feces, and after a certain number of hours inoculate some culture medium from the mixture, and thus determine whether it is sterile or not.

METHOD.—Standard solutions of the disinfectants to be tested were made up according to the following formulæ:

R.—Corros. subl.	. . . . .	3ij.
Water.	. . . . .	C. i.
R.—Chloride of lime ²	. . . . .	3iv.
Water	. . . . .	C. i.
R.—Sulphate of iron	. . . . .	3xviiij.
Water	. . . . .	C. i.

¹ The experiments included in this paper were performed in the laboratories of the Yale Medical School.

² This was up to the pharmacopœial strength, but not up to the commercial.

R.—Corros. subl.	3ij.
Tartaric acid	3x.
Water	C. i.
R.—Hydrochloric acid	1 per cent. (3x to C. i.)
R.—Corros. subl.	3ij.
Hydrochloric acid	3x.
Water	C. i.
R.—Carbolic acid	5 per cent. (3l to C. i.)
R.—Corros. subl.	3ij.
Potass. permang.	3ij.
Water	C. i.

As a test mixture, normal feces were used mixed with about two-thirds their bulk of decomposing urine. The feces were thoroughly mixed with the urine, and the mixture had about the consistency of pea-soup. A fresh fecal mixture was made for each experiment and, although the mixtures were of nearly uniform consistency, there was undoubtedly some variation in the amount of solid matter present in each, consequently it is not entirely safe to compare the effects of a disinfectant in one experiment with those of another one in a different experiment. Five hundred cubic centimetres of this mixture were regarded as a dejection in the first five experiments; in the sixth experiment two hundred cubic centimetres were used.

A normal daily evacuation of the bowels amounts, according to Vallin, to 150 to 200 grammes (5 to 6½ ounces); according to Dr. Edward Smith, to 8.55 ounces. In pathological conditions, however, such as cholera or typhoid fever after an intestinal hemorrhage, the amount of a dejection often approaches a pint or more, and in addition to this a few hundred cubic centimetres of urine are usually passed with the dejection; consequently a pint of fecal matter with urine would not be an unusually large amount to disinfect for one dejection. Since large amounts of fecal matter are hard to handle, with requisite neatness, in a bacteriological laboratory, I have used one-half the amount of the disinfectant usually recommended, with one-half the amount of a dejection.

Two hundred and fifty cubic centimetres of this mixture, therefore, were added to five hundred cubic centimetres of the disinfectant in a glass battery-jar and the whole thoroughly mixed up with a glass rod. This mixture was then poured through a glass funnel into a sterilized glass flask, which, after the careful withdrawal of the funnel so as not to touch the sides of the flask, was plugged with sterilized cotton. At the end of one hour, four hours, and forty-eight hours, inoculations were made from this mixture into tubes of sterile beef bouillon and into tubes of nutrient gelatine. The inoculations were made by a loop of sterilized

platinum-wire, which was plunged down to the bottom of the flask during the momentary withdrawal of the cotton plug, and which was thence quickly inoculated into tubes of beef bouillon. The same procedure was repeated in inoculating the gelatine tubes.

The tubes of beef bouillon inoculated were then placed in an incubator at the temperature of 40° C. (104° F.), and watch kept for the first signs of cloudiness, which indicates the presence of bacteria.

The gelatine tubes which were inoculated were immediately made into plates, which were kept for eight days at the temperature of the laboratory (70° F.). The colonies which had then developed were counted. In some cases it was necessary to count the number before this on account of the liquefaction of the gelatine.

The experiments consisted of six series. Each one of the series was performed at a different time, and in each one both nutrient gelatine and beef bouillon were used as culture fluids. In the first series the gelatine plates were duplicated; both tubes and plates were duplicated in the third series.

Two different culture media were used, that each might be a check on the other. Nutrient gelatine has a wider range as a nutrient medium than beef bouillon, and, therefore, the experiments with this are of more value. Certain bacteria will grow in gelatine that will not grow in beef bouillon, as, for example, *staphylococcus pyogenes aureus*. I have also isolated pure cultures of two species of bacteria, taken from the colonies of gelatine plates of Experiment V. of chloride of lime, which will not grow in beef bouillon. This explains partly why the results with gelatine plates frequently differ from the results with beef bouillon.

On the other hand, I have not found any bacteria in beef bouillon that will not grow in gelatine. It will be observed that in Experiment VI. the gelatine plates inoculated from the carbolic acid mixture, after one hour and forty-eight hours, were sterile, while the corresponding beef bouillon tubes broke down. I therefore inoculated gelatine tubes from the bouillon cultures, and found that the bacteria thus inoculated grew luxuriantly in gelatine. How to explain this discrepancy I do not know, unless it may be said that the spores of certain bacteria will not develop in gelatine, while the bacteria themselves grow well in this.

The gelatine plates give us a rough quantitative estimation of the effects of the disinfectant used. They further show us that the colonies often develop from minute lumps of fecal matter, easily seen in the gelatine, showing that even a very small amount of fecal matter around a bacterium is often sufficient to protect it from powerful disinfectants. It may be well to state that the mixture of feces with chloride of lime forms an adhesive froth containing much solid matter; and, consequently, a greater mass adheres to the inoculating needle and is inoculated into the culture medium than in the case of the mixtures with

other disinfectants; consequently, comparing the number of colonies of the plates inoculated from this germicide, with those from others, places chloride of lime at a disadvantage.

After inoculations had been made from the mixtures of feces and disinfectants, at the end of forty-eight hours, the mixtures containing the bichloride were filtered and the filtrates tested quantitatively for mercury. The process of filtering exposed the mixture freely to the air of the laboratory for twenty-four hours or longer. After filtration the filtrates were tested to see whether they were sterile by inoculating a drop of each filtrate into a tube of sterile bouillon. The tubes were then placed in an incubator and watch kept for cloudiness.

The filtrates were also tested to see whether they possessed any germicidal properties. To do this, equal parts of a filtrate and of a beef bouillon culture of the bacillus typhosus were mixed with each other, and after standing the time stated below in the table, inoculations were made into tubes of bouillon.

Only the first, fifth, and sixth experiments with the chloride of lime are valuable, the others are only remarkable to emphasize the fact that solutions of the chloride of lime rapidly deteriorate by keeping, even when in tightly corked bottles. In comparing the power of the chloride of lime with that of the other disinfectants, only those experiments should be compared where a fresh solution of chloride of lime was used.

These experiments furnished an excellent opportunity to observe the deodorant effects of the disinfectants tested. Sulphate of iron, which is often regarded as a good deodorant, developed an odor considerably more disagreeable than that of the mixture of feces with sterilized water. The odor did not seem to be lessened in any appreciable degree after seventy-two hours when the flask was emptied. The bichloride and the mixtures of the bichloride with hydrochloric acid, tartaric acid, and potassium permanganate are primarily good deodorants. Thus at the end of four hours there was no appreciable odor from mixtures containing these. After forty-eight hours, however, a very sickening odor was developed in all these mixtures. This was not of putrefactive origin, since the mixtures were frequently perfectly sterile. Chloride of lime rapidly destroyed all fecal odor, but replaced it by its own. Carbolic acid also destroyed all fecal odor after four hours.

I am indebted to Dr. H. E. Smith, Professor of Chemistry in the Yale Medical School, for the following statement of the method adopted for determining the amount of mercury in the filtrates; for all the chemical analyses I am greatly indebted to Mr. W. P. Baldwin, of the Yale Medical School.

"The Solution of Mercuric Chloride.—To make the 1:500 solution of bichloride, fourteen grammes of the dry salt were dissolved in seven litres of distilled water. That the solution was of the desired strength,

and that it did not become weaker by precipitation during the period of experimenting with it, is shown by the following analytical results: 200 c.c. were acidulated and the mercury precipitated as sulphide, which was collected and weighed on filter-papers.

"I. The fresh solution, before the experiments:

HgS obtained.	Calculated as HgCl_2 .	Required.
(1) 0.3433 grm.	0.4010 grm.	0.4 grm.
(2) 0.3425 "	0.4001 "	

"II. After the experiments, when the solution was three and a half months old:

HgS obtained.	Calculated as HgCl_2 .	Required.
(1) 0.3441 grm.	0.4019 grm.	0.4 grm.
(2) 0.3424 "	0.4000 "	

"*The Method of Chemical Analysis.*—It was our intention to ascertain how much of the mercury was precipitated in the fecal mixture, by separating the fluid portion by filtration, washing the solid residue with water, and determining the mercury remaining in the filtrate and wash water; but it was found to be impracticable to do this, on account of the difficulties of filtration. Therefore, the mixture was in each case put on dry filter-papers, and these changed from time to time until the chief part of the liquid portion had been separated as a clear filtrate. This filtrate was thoroughly mixed and the mercury determined in a portion of it. The results show the mercurial strength of the fluid portion of the mixture after precipitation had been effected.

"The mercury was determined according to the principle of Ludwig.¹

"The procedure was as follows: From 100 to 200 c.c. of the filtrate was acidulated with from 5 to 10 c.c. of concentrated HCl , and heated gently in a covered beaker with 0.5 to 0.75 gramme of KClO_3 until of a light yellow color. After filtering, two gramme of brass filings were added, and the mixture thoroughly stirred from time to time for about half an hour. The amalgam was then collected on asbestos by filtering through a Gooch's crucible, and washed with water, alcohol, and ether; when dry it was transferred with the asbestos filter to a combustion tube closed at one end. The crucible was thoroughly cleaned with more brass filings and asbestos, which were added to the contents of the tube. A layer of dry CuO was then added with a plug of asbestos, and the open end of the tube drawn out to a capillary tube. The CuO was found to be necessary to oxidize the flocculent organic matter which separated during the treatment with the brass. The tube was heated for about half an hour at a dull red heat, and then aspirated very slowly for a few minutes.

¹ Wien. med. Jahrb., 1887, S. 143, and Zeitschr. f. Physiol. Chem., vi. S. 495.

Filtrate tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate . . . 0.00277

EXPERIMENT II.

	1 hour.	4 hours.	48 hours.	Remarks.
<i>Gelatine plates :</i>				
Bichloride	97 colonies.	13 colonies.	Sterile.	Solution 2 weeks old.
Chloride of lime	4 colonies.	Sterile.	1 colony.	
Sterilized water	Innumerable.	Innumerable.	Innumerable.	
Sulphate of iron	Innumerable.	Innumerable.	Innumerable.	
Bichloride & tart. acid	16 colonies.	Sterile.	Sterile.	
<i>Beef bouillon ;</i>				
Bichloride	Cloudy.	Cloudy.	Sterile.	Solution 2 weeks old.
Chloride of lime	Sterile.	Sterile.	Sterile.	
Sterilized water	Cloudy.	Cloudy.	Cloudy.	
Sulphate of iron	Cloudy.	Cloudy.	Cloudy.	
Bichloride & tart. acid	Cloudy.	Sterile.	Sterile.	

Filtrate from bichloride mixture tested to see whether it is sterile, as in Experiment I. Filtrate of bichloride with tartaric acid tested in the same way:

Bouillon tubes inoculated with bichloride filtrate . . . $\begin{cases} a, \text{sterile.} \\ b, \text{sterile.} \end{cases}$

"	"	"	"	bichl. and tart. acid filtrate	$\left\{ \begin{array}{l} a, \text{ sterile.} \\ b, \text{ sterile.} \end{array} \right.$
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Filtrates, from both the bichloride mixture and from the bichloride with tartaric acid mixture, tested to see whether they are germicides, as in Experiment I.:

Bouillon tube inoculated from bichloride filtrate after 6 hours, sterile.

“ “ “ “ bichl. and tart. acid “ “ “ “

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of bichloride filtrate	. . . 0.00625
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"	"	"	"	of bichlor. and tart. acid filtrate	0.03135
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EXPERIMENT III.

	1 hour.	4 hours.	48 hours.	Remarks.
<i>Gelatine plates :</i>				
Bichloride	$\left\{ \begin{array}{l} a \text{ 47 colonies.} \\ b \text{ 124 colonies.} \end{array} \right.$	$\left\{ \begin{array}{l} 62 \text{ colonies.} \\ 48 \text{ colonies.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ 2 \text{ colonies.} \end{array} \right.$	
Bichlor. & hydrochl. acid	$\left\{ \begin{array}{l} \text{Sterile.} \\ 1 \text{ colony.} \end{array} \right.$	$\left\{ \begin{array}{l} 2 \text{ colonies.} \\ \text{Sterile.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ 1 \text{ colony.} \end{array} \right.$	
Bichloride & tart. acid	$\left\{ \begin{array}{l} a \text{ 26 colonies.} \\ b \text{ 13 colonies.} \end{array} \right.$	$\left\{ \begin{array}{l} 24 \text{ colonies.} \\ 10 \text{ colonies.} \end{array} \right.$	$\left\{ \begin{array}{l} 1 \text{ colony.} \\ \text{Sterile.} \end{array} \right.$	
Hydrochloric acid . . .	$\left\{ \begin{array}{l} a \text{ 80 colonies.} \\ b \text{ 80 colonies.} \end{array} \right.$	$\left\{ \begin{array}{l} 39 \text{ colonies.} \\ 16 \text{ colonies.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ \text{Sterile.} \end{array} \right.$	
Chloride of lime . . .	$\left\{ \begin{array}{l} a \text{ Innumerable.} \\ b \text{ 5 colonies.} \end{array} \right.$	$\left\{ \begin{array}{l} 4 \text{ colonies.} \\ 2 \text{ colonies.} \end{array} \right.$	$\left\{ \begin{array}{l} 1 \text{ colony.} \\ 1 \text{ colony.} \end{array} \right.$	Solution 3 weeks old.
<i>Beef bouillon :</i>				
Bichloride	$\left\{ \begin{array}{l} a \text{ Cloudy.} \\ b \text{ Sterile.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ \text{Sterile.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ \text{Sterile.} \end{array} \right.$	
Bichlor. & hydrochl. acid	$\left\{ \begin{array}{l} a \text{ Sterile.} \\ b \text{ Sterile.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ \text{Sterile.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ \text{Sterile.} \end{array} \right.$	
Bichloride & tart. acid	$\left\{ \begin{array}{l} a \text{ Sterile.} \\ b \text{ Sterile.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ \text{Sterile.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ \text{Sterile.} \end{array} \right.$	
Hydrochloric acid . . .	$\left\{ \begin{array}{l} a \text{ Cloudy.} \\ b \text{ Cloudy.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Cloudy.} \\ \text{Cloudy.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Cloudy.} \\ \text{Sterile.} \end{array} \right.$	
Chloride of lime . . .	$\left\{ \begin{array}{l} a \text{ Sterile.} \\ b \text{ Cloudy.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Cloudy.} \\ \text{Sterile.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Sterile.} \\ \text{Cloudy.} \end{array} \right.$	Solution 3 weeks old.

Filtrates of bichloride, of bichloride with tartaric acid, and of bichloride with hydrochloric acid, tested to see whether they are sterile, as in Experiment I.:

Bichloride filtrate sterile.
 Bichloride and tart. acid sterile.
 Bichloride and hydrochlor. acid sterile.

Tested to see whether they are germicides, as in Experiment I.:

Tubes inoculated from bichloride filtrate after 6 hours . . . sterile.
 " " " " and hydrochlor. acid after 6 hours, sterile.
 " " " " and tart. acid after 6 hours . . . sterile.

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate—
 of bichloride 0.00263
 of bichloride and hydrochlor. acid . . . 0.01888
 of bichloride and tart. acid 0.0237

EXPERIMENT IV.

	1 hour.	4 hours	48 hours.	Remarks.
<i>Gelatine plates:</i>				
Bichloride	61 colonies.	1 colony.	Sterile.	
Bichloride & hydrochl. acid . . .	Sterile.	Sterile.	Sterile.	
Bichloride & tart. acid . . .	116 colonies.	2 colonies.	7080 colonies.	
Hydrochloric acid	Innumerable.	Innumerable.	Sterile.	
Chloride of lime	53 colonies.	57 colonies.	Innumerable.	Solution 5 weeks old.
<i>Beef bouillon:</i>				
Bichloride	Cloudy.	Cloudy.	Cloudy.	
Bichloride & hydrochl. acid . . .	Sterile.	Sterile.	Sterile.	
Bichloride & tart. acid . . .	Cloudy.	Cloudy.	Sterile.	
Hydrochloric acid	Cloudy.	Cloudy.	Cloudy.	
Chloride of lime	Cloudy.	Cloudy.	Cloudy.	Solution 5 weeks old

Filtrates of bichloride, of bichloride with tartaric acid, and of bichloride with hydrochloric acid, tested to see whether they are sterile, as in Experiment I.:

Bichloride filtrate sterile.
 Bichloride and tart. acid sterile.
 Bichloride and hydrochlor. acid sterile.

Germicidal power of filtrates not tested in this experiment.

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate—
 of bichloride 0.00568
 of bichloride and tart. acid 0.005¹
 of bichloride and hydrochlor. acid . . . 0.0195

¹ Probably some error in the estimation.

EXPERIMENT V.

	1 hour.	4 hours.	48 hours.	Remarks.
<i>Gelatine plates:</i>				
Bichloride	332 colonies.	13 colonies.	75 colonies.	Fresh solution.
Bichloride & hydrochl. acid	2 colonies.	Sterile.	Sterile.	
Bichloride & tart. acid	1 colony.	1 colony.	1 colony.	
Carbolic acid	2 colonies.	2 colonies.	Sterile.	
Chloride of lime	3 colonies.	6 colonies.	1 colony.	
<i>Beef bouillon:</i>				
Bichloride	Cloudy.	Cloudy.	Cloudy.	Fresh solution.
Bichloride & hydrochl. acid	Sterile.	Sterile.	Sterile.	
Bichloride & tart. acid	Sterile.	Sterile.	Sterile.	
Carbolic acid	Cloudy.	Cloudy.	Cloudy.	
Chloride of lime	Sterile.	Sterile.	Sterile.	

Filtrates of bichloride, of bichloride with tartaric acid, and of bichloride with hydrochloric acid, tested to see whether they are sterile, as in Experiment I.:

Bichloride filtrate	sterile.
Bichloride and tart. acid	sterile.
Bichloride and hydrochlor. acid	sterile.

Germicidal power of filtrates not tested in this experiment.

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate—	
of bichloride	0.0027
of bichloride and tart. acid	0.0372
of bichloride and hydrochlor. acid	0.0269

EXPERIMENT VI.

	1 hour.	4 hours.	48 hours.	Remarks.
<i>Gelatine plates:</i>				
Bichloride	9 colonies.	1 colony.	1 colony.	} 500 c. c. of germicide added to 100 c. c. of feces.
Bichloride & hydrochl. acid	1 colony.	Sterile.	Sterile.	
Bichloride & potass. permang.	Sterile.	Sterile.	Sterile.	
Carbolic acid	Sterile.	1 colony.	Sterile.	
Chloride of lime	20 colonies.	Sterile.	Sterile.	
<i>Beef bouillon:</i>				
Bichloride	Sterile.	Sterile.	Sterile.	} 500 c. c. of germicide added to 100 c. c. of feces.
Bichloride & hydrochl. acid	Sterile.	Sterile.	Sterile.	
Bichloride & potass. permang.	Sterile.	Sterile.	Sterile.	
Carbolic acid	Cloudy.	Cloudy.	Cloudy.	
Chloride of lime	Cloudy.	Sterile.	Sterile.	

Filtrates of bichloride, of bichloride with hydrochloric acid, and of bichloride with potass. permang., tested to see whether they are sterile, as in Experiment I.:

Bichloride filtrate	sterile.
Bichloride and hydrochlor. acid	sterile.
Bichloride and potass. permang.	sterile.

Germicidal power of filtrates tested as in Experiment I.:

Tube inoculated from bichloride filtrate after 6 hours	sterile.
" " " " and hydrochlor. acid after 6 hours	sterile.
" " " " and potass. permang. after 6 hours	sterile.

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate—

of bichloride	0.0092
of bichloride and hydrochlor. acid	0.0647
of bichloride and potass. permang.	0.0048

Below is a table compiled from the above experiments showing the amount of metallic mercury in grammes in 100 c. c. of the filtrate, the same amount calculated as bichloride, and the amount of the bichloride required in 100 c. c. of the filtrate, if all the bichloride added to the fecal mixture were held in solution.

		Amount of metallic mer- cury.	Calculated as bichloride.	Amount re- quired if all added were held in solu- tion.
Bichloride	Experiment I.	0.00277	0.00375	0.133
	" II.	0.00625	0.008468	0.133
	" III.	0.00263	0.00356	0.133
	" IV.	0.00568	0.00769	0.133
	" V.	0.0027	0.00365	0.133
	" VI.	0.0092	0.01246	0.166
Bichloride & tart. acid	Experiment II.	0.03135	0.04248	0.133
	" III.	0.0237	0.0321	0.133
	" IV.	0.005	0.0067	0.133
	" V.	0.0372	0.0504	0.133
Bichloride & hydrochlor. acid	Experiment III.	0.01888	0.02558	0.133
	" IV.	0.0195	0.0264	0.133
	" V.	0.0269	0.03644	0.133
	" VI.	0.0647	0.0876	0.166
Bichloride & potassium permang.	Experiment VI.	0.0048	0.0065	0.166

Below is a table, based on the first five experiments, giving the percentage of gelatine plates and tubes of bouillon remaining sterile for each disinfectant tested. In the case of the chloride of lime only Experiments I. and V. are taken into the average.

	1 hour.	4 hours.	48 hours.
Bichloride	8 per cent.	25 per cent.	60 per cent.
Chloride of lime	80 "	75 "	50 "
Bichloride & tart. acid	30 "	50 "	70 "
Bichloride & hydrochlor. acid	75 "	87 "	87 "
Hydrochlor. acid	0 "	0 "	66 "
Carbolic acid	0 "	0 "	50 "

This table shows that none of these disinfectants are entirely reliable in the proportions used. It does, however, show their relative value well.

The bichloride with hydrochloric acid is by far the most efficient disinfectant. Next in order stands chloride of lime, which acts less efficiently but more rapidly than the bichloride with hydrochloric acid.

The addition of tartaric acid to the bichloride solution somewhat increases its power, though not nearly so much as hydrochloric acid.

The sulphate of iron in Experiment II. shows itself totally inefficient, both as a disinfectant and deodorizer, and there is no rational basis for its use for these purposes. One per cent. solutions of hydrochloric acid, and five per cent. solutions of carbolic acid, have little power as disinfectants.

Experiment VI. has not been included in the above deductions, since the proportion of feces to disinfectant differed from that of the first five experiments. It confirms our conclusions as to the value of the bichloride with hydrochloric acid and of the chloride of lime. It shows that the addition of potassium permanganate to the bichloride solution considerably increases its efficacy. Carbolic acid makes a fairly good showing in Experiment VI. with gelatine, but a very poor one with beef bouillon, consequently it is unreliable. The simple bichloride solution has also shown itself unreliable.

The chemical analyses of the filtrates has shown that considerable mercury exists in solution in them, and the bacteriological tests in Experiments II., III., and VI. have shown that this soluble form of mercury is a powerful germicide—even when diluted one-half, capable of destroying the bacillus typhosus after an exposure of six hours; consequently the inefficacy of the bichloride as a disinfectant does not seem to be due to the fact that it forms insoluble, inert compounds with organic matter, for the compounds are neither insoluble nor inert, but rather due to the lack of power of penetrating organic matter. This being the case, it is doubtful if an increase, within certain limits, in the proportion of the bichloride to feces, would increase its efficacy much.

Experiment VI. further shows that one pint of the best disinfectants (bichloride with hydrochloric acid, bichloride with potassium permanganate, and chloride of lime) is sufficient to sterilize a semi-solid dejection consisting of 100 c.c., after four hours' exposure, but that it is insufficient to sterilize, after four hours' exposure, one of 250 c.c. in a small proportion of cases. Therefore one pint of these disinfectants should be used to every 100 c.c. of a semi-solid dejection.

These experiments were all performed with normal feces. The probability is very slight that these same disinfectants which are efficient in sterilizing normal feces would prove inefficient in cases where pathogenic germs exist, since the spores of the hay bacillus which exist in normal feces are certainly as resistant to the action of germicides as the most resistant pathogenic germs, and far more resistant than the pathogenic

germs most common in feces, such as the bacillus typhosus and the comma bacillus.

CONCLUSIONS.—The best disinfectants to use are the bichloride with hydrochloric acid, the bichloride with potassium permanganate, and the chloride of lime.

Five per cent. solutions of carbolic acid and two-tenths per cent. solutions of the bichloride are unreliable even when used in the proportion of one pint to every 100 c.c. of dejection.

Emphasis needs to be laid on the necessity of thorough disintegration of the fecal matter by stirring with the disinfectant, and on the necessity of allowing the mixture to stand four hours at least before emptying.

For continued use the bichloride solutions would injure lead pipe, while if used for a few days only, probably no injury would result. For long-continued use, where the dejections are thrown into a water-closet, chloride of lime is undoubtedly the most available disinfectant.

Solutions of chloride of lime should be kept tightly corked and should not be used after they are one week old.

ON VARICOSE VEINS OF THE BROAD LIGAMENTS.

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WHEN we consider the composition of the female pelvis, and study it more particularly with regard to its adaptation to the erect position, we cannot fail to be struck with many problems of interest which it presents, nor can we express surprise that circumstances should frequently combine to occasion deviations from the type of health.

The nature of the circulation, the demands pertaining to physiological requirements, which disturb this, and the complex relations of influences vital and mechanical, give rise to unknown quantities in the formation of estimates. The very nature of the processes involved tends to make perversions liable and to render solution difficult.

It is to some changes in the circulation of the pelvic contents which I wish to call attention, and to endeavor to show that we often fail to allow due proportion to the amount of suffering which arises from changes in this particular respect. Indeed, I am of opinion that a larger share than is considered usual of the ailments of the sex should be credited to causes which have their foundation in changes of the circulation; and I am confident in the assurance that the practical application of this belief is attended with much success in treatment.

Briefly, I may refer to the relations of these structures and the blood-

supply which pervades them. The broad ligaments consist of two quadrangular folds of peritoneum, reaching from the sides of the uterus to the sides of the pelvis. Between the two layers is a quantity of cellular tissue, more or less thick at places, in which the vessels and nerves lie embedded. There is also an amount of muscular fibres derived from the sides of the uterus, and, in addition, the remains of the Wolffian body, or organ of Rosenmüller.

The relation of the cellular tissue is important: it is slight above, but becomes much thicker and looser at the lower level and sides of the uterus. The vessels permeating it are numerous. The uterine arteries, derived from the hypogastric and ovarian arteries, give off a number of parallel branches, which arise at right angles to the main trunk and anastomose freely with the corresponding branches of the opposite side. The ovarian artery, arising from the aorta, gives off a number of branches to the ovary, and, passing by the side of the uterus to the cervix, inosculates with the uterine branch of the internal iliac. On the sides of the uterus the sinuses communicate with large venous plexuses in the broad ligament; these are continuous below with the vaginal plexus, and above with the subovarian plexus, constituting a mass of veins called the pampiniform plexus. Thus the vaginal, uterine, and ovarian veins communicate freely. The ovarian veins are only fully developed after puberty; they possess but few valves, and are remarkable for their number and their size. They begin, as veins do, by radicles continuous with the capillaries, but they rapidly get larger, become knotty, as if varicose at points,¹ and form by anastomosis a plexus with irregular meshes. From this plexus emerge trunks which run parallel to the arterial division and terminate in the utero-ovarian vein, which empties on the right side into the vena cava, and on the left into the renal vein.

From this account of the circulation in the broad ligaments, it will be seen that they consist chiefly of an intricate network of veins; these veins have very few and inefficient valves, so as to be practically destitute of any influence from them. There is also another peculiarity in some of them which aids in promoting derangement—the presence of muscular trabeculæ and smooth muscular fibres; these, in contracting, prevent the return of blood in the capillaries and small veins, and in some parts, such as the spongy portion of the ovary, give all the characters of an erectile organism.

On reflection, we can readily recognize that the main disturbing elements in the circulation in the pelvis are: (1) sexual relations, (2) the function of menstruation, (3) childbearing. In the first there is considerable tension in the circulatory arrangements; in the second process

¹ Courty: Diseases of the Uterus.

the active hyperæmia, rupture of one or more follicles, and disintegration of the uterine mucous membrane, are often attended by profound disturbance; while in the course of pregnancy and parturition the vessels become greatly enlarged, and their work increased, from the augmented blood-supply necessary for so long a period; this strain often leaves permanent ill-effects.

In organs subject to perpetual variations of blood-supply from inherent or natural causes, with but slender mechanical protection, under the supervision of a delicate and sensitive nerve organization, imperfectly controlled and influenced by emotions and passions, the standard of physiological health cannot be a high or a secure one. So, on deliberate thought, we find it. There is an individuality which tends, more or less, toward a perfect type, which is, I think, seldom or never realized. This differs so as to form a standard in each individual, and it is upon a correct knowledge of this that we may base our observations in any given instance. From this we may form deductions and fairly reason from facts to principles.

Starting, then, from what may be looked upon as the normal state of the circulation in the broad ligaments, it will be found that one of the most frequent changes is a varicose condition of the veins of these parts. It is an aggravation, so to speak, of an existing condition. Just as in our moral nature the existence of a virtue may become a vice, so we often find that extremes meet in physical life, and that a physiological function in a strained degree may drift into a pathological process. Numerous illustrations of this could be adduced; pregnancy, for example, is a natural or physiological function, and yet how often it becomes pathological. Certain disorders, spoken of as functional, by persistence or repetition ultimately come to involve change of structure, and in this way may be recognized the origin and explanation of many diseases. In the pelvis we can often trace the following sequence: The veins, instead of emptying, remain distended and full; the weight of the parts is thereby increased, and they become more bulky and heavy; menstrual irregularities are promoted, and local discomfort and pain are experienced.

From this retardation and arrest of circulation, various reflex disturbances are set up, and the sum total is a combination which eventually brings failure of general health in its train. This state of things may subside or yield to treatment, but neglected, or again and again repeated, becomes disastrous. Successive invasions are accompanied by accessory evil agencies until a morbid right of tenure is established, and permanent signs emphasize the presence of an enlarged descending uterus with all the ills of chronic congestion.

The most common causes of varicose veins in the broad ligaments may be divided into two classes: 1. Local. 2. General.

Among the local causes the most frequent in married women is *subinvolution*. We know that in pregnancy there is much congestion of the local venous system; this is evidenced by the dark violet color of the vagina, and often by the presence of varicose veins in the labia; the vaginal plexus communicating, as we have noticed, with the pampiniform plexus in the broad ligament.

When the uterus is emptied of its contents at full term, it is prone to arrest in the process of involution from various reasons; and it is in this condition, where attempted restitution fails, that the veins around it are apt to become dilated and varicose. The failure of involution is more frequent after abortion than after delivery at full term, because from being an abnormal event it is more likely to be associated with disease. The progressive development of the uterus being cut short, there is a greater difficulty in the assumption of the means toward a normal restitution of its structure. The muscular fibre cells retain their condition of partial development—as it were, reluctant to take on the changes of fatty degeneration, atrophy, and absorption which a more natural end to pregnancy brings. Hence the uterus remains increased in bulk and weight, and the circulation in it and its vicinity is hindered and exposed to further complications.

Subinvolution is the incubus of uterine disorders; it is the centre from which innumerable ailments spring and evolve. It is the most frequent source of uterine disease. Aran was right when he classed two-thirds of all utero-ovarian disease as the results of pregnancy, labor, and abortion, subinvolution being the basis upon which the number is founded.

Displacements of the uterus, from whatever origin, will be likely to cause arrest in the circulation of the broad ligaments and a tendency to the formation of varicose veins. Displacement, indeed, is only a symptom. As in descent it involves some relaxation of the suspensory ligaments of the uterus, we must look to these for the reason. It is usually found that some degree of retroversion precedes it, and to admit of this there must be some weakening of the supporting structures, the broad ligaments, and the utero-sacral ligaments; the want of elasticity and power ultimately involves the structure of the ligaments themselves, and renders the circulation more tardy. Pressure on the rectum leads to constipation and hemorrhoids, while straining, lifting weights, or standing for a length of time, considerably aggravates the condition. I have found that anteversion in an inordinate degree is a frequent occurrence and common cause of arrest of circulation. The uterus, obeying its natural inclination forward, is pressed upon by the abdominal contents above, aided by tight lacing or the fashionable abuse of an abdominal belt. At times it becomes completely subverted; bimanually the fundus can be felt above the pubis, while the os uteri points directly upward toward the sacrum and chafes against the upper part of the posterior

cul-de-sac. The broad ligaments are thus twisted on their lateral axes, and necessarily the blood-flow through them is impeded or blocked by the most effectual of mechanical means.

Constipation, as a habit, favors stagnation in the pelvic circulation, and from this reason must be regarded as a factor in the production of ill-effects arising from its persistence.

In short, anything which alters the position or increases the weight of the uterus, or weakens its supports, invites the presence of enfeebled or varicose veins.

It is of common occurrence to meet with cases where the relation of cause and effect may be traced in their reaction upon each other. What a vicious circle presents itself: the uterus is enlarged from some of the causes I have mentioned; the enlargement gives rise to increased weight; of course, larger size and bulk cause alteration in position; malposition engenders stasis or defective circulation; malnutrition is the result: from these come pressure, erosions, catarrh, pain, and reflex symptoms; the general health becomes affected, and resents the local irritation; malaise, feebleness, neuroses, and loss of power in mind and body follow. Thus the symptoms surely evolve, until the patient finally breaks down and becomes a confirmed invalid of a type unfortunately well known. These chronic conditions are not rare; interpreted by a recognition of these phenomena, they find a true solution only in the correction of the cause which calls them into existence.

The strongest test to apply to any method of clinical reasoning is the test of experience. The application of treatment based upon right theory is, in the truest sense, logical, and the practical outcome must, therefore, be expected to prove the premises correct; experience shows that this is so, and that in adjusting the circulation and remedying the various drawbacks which pervert it, we restore the lost balance, make the return to health possible, and generally certain.

There are, in the second place, some constitutional states of health which are associated with defects in the circulation, and which affect that of the pelvis particularly. Deficient power in the right side of the heart from organic disease or lung complications, liver affections, and disorders of the digestive apparatus, often are accompanied by hemorrhoids and pelvic congestion from obstruction in the portal system. Pressure from abdominal tumors also induces the same effects. Renal troubles constantly give rise to impurity and increased liability to disease, the venous circulation partaking readily of the taint thus imported. The veins lose tone and elasticity, they become more lax and easily dilated, and at times set up local inflammation and thickening in spots or short tracts, which destroy their vitality and tend to constrictions, contortions, or varices.

From what has been said, it will be inferred that the symptoms of

varicose veins in the pelvis are those associated with slackening or arrest of the blood current in the neighborhood of the uterus.

Thus there may be a sense of weight and fulness in the pelvis, sometimes most felt at the sacrum or perineum; dull aching in the back; what are described as dragging pains; local discomfort and uneasiness, with often some interference with micturition, or vesical irritation; generally, too, constipation.

There will probably be found some alteration in the position of the uterus, backward, forward, or some degree of descent. The cervix is generally œdematous, with catarrhal discharge from its interior, and some increase of secretion from the vaginal mucous membrane. All these indications are aggravated by the upright position, by long standing, or by unusual fatigue or exertion. It will be observed that the mucous membrane of the vagina is dark colored; there are often full and enlarged veins in the vaginal roof or in the labia. Bimanually fulness may be detected in the broad ligaments, particularly if careful examination in this manner is made by the rectum, and an appreciable enlargement is often felt. If these conditions exist with hemorrhoids in conjunction with a vascular system enfeebled by constitutional derangements, we may be satisfied that the broad ligaments are suffering, and that their form has become altered and their veins varicose.

"Sometimes in the thickness of the broad ligaments, dilated venous bundles, resembling the pampiniform plexus in man, forming tumors of varying dimensions, attaining half the size of the fist, and reaching the renal region, coinciding with great congestion of the uterine tissue, and very marked in aged women who have succumbed in the midst of symptoms of obstruction of the venous, abdominal, or general circulation."¹

In one case of this kind, to which my attention was called by Dr. Hogben, the veins in the broad ligaments were quite as thick as the little finger, and formed masses the size of a hen's egg in each.

With this view of the pathological changes resulting from the train of complications I have enumerated, it is no doubt possible to conjecture what the rational treatment should be. It obviously aims at restoring the equilibrium of the circulation and maintaining it in a healthy tone.

Bleeding is one of the most useful practices which has fallen into disuse in modern times. Yet its advantages are undoubted, and have been extolled by those whose testimony is indubitable. In the presence of uterine congestion, and where the veins are full and plentiful, local bloodletting is of the highest service. It is of much benefit, and of the first consideration, to relieve the bloodvessels and to pave the way to subsequent treatment. The application of leeches to the cervix is tedious and troublesome, and though it answers well, the results can be as effectually obtained by puncturing the cervix. Five or six punctures

¹ Courty: Diseases of the Uterus, p. 467.

a quarter of an inch deep can be made, and three or four drachms of blood taken away. The best time to do this is soon after a menstrual period, again in about ten days, and also before the menstrual return. After the bleeding a tampon of cotton soaked in glycerine packed around the cervix gives relief to the vessels and comfort to the local symptoms. The number of times this may require to be repeated depends upon the amount of congestion and the effect produced.

Combined with this method much assistance in reducing congestion will be gained by the daily use of irrigation with hot water, two or three pints at a temperature of 100° or 110° Fahrenheit allowed to pour slowly against the cervix and vaginal roof.

The next step is the application of a well-adjusted Hodge's pessary. Perhaps no appliance is capable of doing more good in certain cases than a properly applied pessary, and I have constantly seen patients whose existence with regard to the duties of daily routine has been almost intolerable, enter a new phase of life by the right use of this simple instrument. Rightly used, it lifts up the uterus, it restores its position, it takes off the superincumbent weight of intestines, it keeps the vaginal walls in some measure apart, and thus allays irritability and inflammation, and, above all, it allows the circulation to be properly conducted. But, to be useful, it must be made to fit the patient. It is a common practice to apply pessaries on the plan of Procrustes' bed—to make the patient fix the pessary. There could not be a greater error, or a more fertile source of harm. At times a little ingenuity is required, but well done it is eminently worth the trouble and procures a marked effect.

The application of a pessary is like many devices in the ordinary run of mechanical treatment, which exemplify the fact that it is the abuse and not the use which brings discredit on the mode of treatment. To stuff a pessary into the vagina forgetful of the method of action upon which it should be applied, regardless of all consideration of form, size, shape, or material of object, or containing space, is hardly likely to do good. So much recklessness has been observed in this respect that it has called forth just condemnation, and the comment that at times it requires more skill to remove a pessary than to introduce one! All instrumental appliances require care and watching for a time until their due effect is produced; much more is this the case in dealing with delicate structures where there is likely to be resentment from rough usage or ill-judged calculations of adaptation.

We must be mindful also of the general health. Constipation is the chief trouble of local importance; due attention to rest, exercise, and dietetic regulations must not be omitted.

There are occasionally met with, instances which resist all methods of treatment however judiciously planned or arranged. Some ulterior

measures which have for their object a radical cure may be adopted. Months or even years may fail to bring the patient to the required standard of health for the active purposes of life; the best-directed efforts may not have been successful in displacing the chronic invalidism which is associated with enlarged and varicose veins in this direction. Presuming that we have exhausted all ordinary resources which experience and skill may have suggested, is there any other plan of treatment to fall back upon? Wearied with persistent efforts of cure, worn down by constant pain, with the present heartless, and the future obscure; in such a state of abeyance in the participation of life's work, and duties unfulfilled, I think that we are still justified in holding out some hope and reason in the vindication of our resources. We may therefore put before the patient the possibility of an operation curing her, provided that she is willing to take the risks of dangers along with the chances of success.

The operation consists in opening the abdomen, tying the veins of the broad ligaments, and removing the ovaries and tubes so as to bring on the menopause prematurely. That such a proceeding promises fairly I am satisfied: it requires some extended observation to collect a sufficient number of cases for record. This is a matter of time, for as varicose veins bear but a certain proportion to the total number of diseases of women, so the cases which obstinately resist all methods of treatment I have mentioned, must be a small average, and necessarily be a long time in making a show of sufficient number.

Cases suitable for palliative treatment are not at all infrequent, and may easily be picked out from those coming under notice; those entitled to submit to the radical cure are few. Two instances have come under my care and as they form types of a class I will shortly note them.

CASE I.—Mrs. —, aged thirty-seven. Pale, lymphatic temperament, average height. Four children; youngest nine years old. Has been ailing for between two and three years with pelvic pain, aching in the back, bearing-down sensations, leucorrhœa, and general ill-health. The symptoms are aggravated by standing, and especially by remaining any length of time in the erect position. She has hemorrhoids, varicose veins in the legs and inner aspect of the thighs, more marked on the left side.

She remained under my care for many months, and had previously consulted several medical men.

The uterus was low, perpendicular, the os and cervix catarrhal. There could be felt a distinct fulness bimanually in the region of the broad ligaments, but the ovaries could not be felt of unusual size. She improved at first under treatment, wore a Hodge's pessary for a long time, worked steadily at the pharmacopœia in the way of drugs as far as her intelligence would admit—for she belonged to a class of individuals who read their prescriptions and want to know the reason of every move in the way of treatment. She ultimately felt inclined to settle down as a permanent invalid. To arrest this calamity I proposed

to operate upon her and see if anything could be done in this direction for her cure. She gladly accepted the opportunity and her husband was sensible enough to concur. I found the broad ligaments enlarged, full of varicose veins, and palpably much distended. I tied these, near the uterus, and again at the sides of the pelvis, taking away a V-shaped piece which included the ovary. The Fallopian tubes I tied separately and also cut away.

There was no trouble or any untoward event in her recovery. She speedily got well, and has since improved more and more, until now, eighteen months after the operation, she declares herself better than she has been for many years. She is cheerful and able to perform all the ordinary functions of life, with no claim to the questionable appellation and still less the surroundings of an invalid.

CASE II. was a single lady thirty-three years old, tall, fresh-colored and languid, wanting in spirit and vitality. She had never been well, she stated, since the advent of her menstrual life. Backache, pains in the pelvis, more so in the left side, hemorrhoids, vaginal discharge, and general lassitude. Menstruation lasted a week, was profuse, painful, and necessitated, or rather implied, rest in bed for the whole week: this had been so for some years. The uterus was larger than natural, lower in the pelvis, the ovaries could both be felt per rectum: they were enlarged, one prolapsed, and the broad ligaments were full and distended. She had dragged on for years of discomfort and inability to get about. Had taken quantities of medicine, been treated by massage, an infinite variety of local remedies, and subjected to all sorts of recommendations and opinions. Fifteen months ago I opened the abdomen. The varicose condition was even more marked than in the previous case. I took away a V-shaped piece of each broad ligament, the ovaries, and tubes. There was no drawback to recovery. Since then she has vastly improved, and is getting stronger still. At times she complains of remnants of the former pain, but they are transient only. I thought it better for her to wear a Hodge's pessary from the first to keep the uterus up until sufficient contraction had taken place in the ligaments. She is in better health than she remembers herself to have been.

It may be urged that the removal of the ovaries and tubes, by anticipating the menopause, produced the good result in this case. It may have aided the attainment of this, but the physical condition of the venous masses was too palpable to claim sole credit for the premature change; the alteration of the circulation may fairly be looked upon as the main factor of success.

TONSILLITIS.

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THE object of this paper is to present some observations made by me during the past two years, coupled with some interesting observations of others culled from the record in literature so far as it has been accessible to me.

Very little is known of the function of the tonsils. The tonsil is a conglomerate of follicles connected with each other by a network of cellular tissue; its surface (covered with a mucous membrane) is not unbroken, but has depressions called lacunæ or crypts. The commonly accepted opinion is that the only function of the tonsil is to secrete a viscid fluid, which is squeezed out of its lacunæ by a bolus of food in passing to lubricate it in its passage onward. Concerning their connection with the lymphatic system opinions differ greatly. Dr. R. Hingston Fox, in an article on the "Functions of the Tonsils," in the July (1886) number of the *Journal of Anatomy and Physiology*, expresses the opinion that these glands belong to the digestive and not to the respiratory tract, and that their function is to reabsorb certain constituents of the saliva in the intervals of the meals which would otherwise be wasted. He calls attention to the fact that their structure is similar to the solitary agminated glands in the intestines. He thinks that the view of their having an absorbent function is further supported by the strong evidence of the power of the tonsil to absorb morbid poisons directly from the saliva.

A. Fränkel¹ calls attention to the possibility of general septic infection originating in the tonsil, and Le Gendre² thinks the tonsils the seat of the initial lesion in scarlatina and diphtheria. A. Jacobi,³ on the other hand, denies an intimate connection of the tonsil with the lymphatic system, and mentions the frequent occurrence of tonsillar diphtheria without systemic infection. Certain it is, however, that in childhood and youth, while the lymphatic system is most active, the tonsils are most liable to disease, and in later years, when the lymphatic circulation is quieter, the liability to those diseases in which the tonsils are affected becomes less.

Acute follicular tonsillitis is an inflammation of the mucous membrane of the tonsil, accompanied by considerable swelling, consisting of an inflammatory infiltration of the lymphatic follicles composing the gland. An extension of the inflammation to the connective tissue situated between the follicles constitutes what is called parenchymatous tonsillitis; and it may or may not go on to suppuration. The invasion is usually abrupt, though it may be preceded by a chill or by repeated chills. At the onset the patient becomes restless, irritable, and hot (the temperature rising to 104° or 105° F.), complains of headache, dysphasia, anorexia, and general lassitude; sometimes the patient complains of severe pains in all the extremities. The tongue is usually covered with a thick yellowish or yellowish-brown coating. Power to open the mouth to any great extent is lost, and swallowing, in some cases, is next to impossible.

¹ Annual of Un. Med. Sciences, 1888, vol. iii. p. 287.

² Ibid., p. 288.

³ Med. Record, Nov. 27, 1886.

Inspection of the parts, internally, will show one tonsil, sometimes both, greatly swollen, of a bright red color, and often patches of a whitish or yellowish secretion adherent to the surface of the tonsil. There is more or less congestion of the anterior and posterior pillars of the fauces and uvula, and very often this extends to the pharynx.

My attention was especially called to this affection by the following case: In December, 1886, I was treating a lady for acute tonsillitis, and on the fourth day of her attack, when she was considerably better, I was asked to look at her little boy, seven years of age, who had had a chill the night before (he had spent the whole of the preceding day in the same room with his mother), and was now complaining of his throat. Examination revealed a follicular tonsillitis; his axillary temperature was 102° F., and he showed signs of considerable constitutional disturbance. This was about 10 A. M. That night I was hurriedly called to my patient: I found him delirious, with a temperature (axillary) of 103.5° F. I had my patient on $\frac{1}{2}$ drop tr. aconite root, 1 gr. potassium chlorate, and 5 m of the ammoniated tr. of guaiac every two hours. I ordered this dose repeated every half hour for three hours, and on the following morning his temperature had fallen to 102°. From this time on he steadily improved, and I discharged him on the sixth day of his attack as well.

Exactly three weeks after the last day of his sickness I was again called to see this little boy; his mother had noticed that his legs were swollen, and for two days she had trouble to get on his shoes; that morning she had noticed that his face was swollen, especially the lower eyelids. Between the time that the mother had sent for me and my arrival the boy had a convulsion, which was followed by another while I was at his bedside, and which ended in coma and death.

This boy had not complained since his attack of tonsillitis, three weeks before.

Although a post-mortem was not allowed, the death of the boy in uræmic coma would not leave much doubt as to the nature of his trouble. During his attack of tonsillitis he had no rash or eruption, nor did his tongue present the characteristic appearance of scarlatina; the diagnosis of diphtheria was negatived by the absence of any tendency to asthenia and by the absence of any glandular tumefaction about the neck.

Since my experience with this case I have carefully watched every case of tonsillitis that has come under my care, and I shall now give the result of observations made on forty-three cases seen by me during the past two years.

AGE.—My experience is not favorable to the opinion of some authors who hold that acute follicular tonsillitis is a disease to which adolescents are peculiarly liable; I met with it only five times in adolescents. On

the other hand, Dr. Haig Brown,¹ the medical officer of an institution containing 500 boys between the ages of twelve and nineteen years, mentions that out of 127 consecutive cases during an epidemic 105 were between fourteen and seventeen years.

SEX.—Twenty-six of my cases were in the male, and seventeen in the female.

HEREDITY.—Six of my cases gave a distinct history of a family tendency to tonsillitis. (Nineteen cases gave a history of rheumatism, six personal, and the rest in the members of the immediate family.) In 127 cases observed by Dr. Brown,² 76 gave a history of a rheumatic condition.

CONTAGIOUSNESS.—I met with nine cases in which the disease was spread by contagion. In one house a man, aged twenty-five years, had an attack of tonsillitis; being an orphan and unmarried, he kept his little brother, aged twelve years, in his room to wait upon him, and on the third day the little fellow had tonsillitis. During the young man's illness he was visited by his fiancé, aged twenty years, who, on leaving him, gave him a "good, long kiss." The following evening, about twenty-four hours after the kiss, she was attacked with acute follicular tonsillitis, and, in turn, communicated it to her sister aged seventeen years.

In none of these cases was there any glandular enlargement; the onset in all of them was with high fever, and all had recovered fully by the fifth day, except the little boy, who was sick ten days. The other cases of contagion happened in three families: one case communicating it to three members of his family, another to two, and the last was a young husband who communicated it to his wife. Dr. Brown³ records two epidemics, unquestionably spread by contagion. In three years he had 416 cases of tonsillitis, and only one of genuine diphtheria.

In discussing a paper on "Follicular Amygdalitis," read by Dr. Jacobi before the New York Academy of Medicine (November 16, 1886), Dr. J. Lewis Smith⁴ mentioned its multiple occurrence in families, although he was not certain that the disease is contagious. Dr. Billington⁵ had seen it occurring as an epidemic, several times, in populous neighborhoods, and recalled one instance in which it affected nearly all of the children in all of the families in a large tenement house.

Possibility of infection through other channels than the tonsils: Froelich,⁶ an army physician, made an autopsy in the case of a soldier who died of peritonitis complicating follicular tonsillitis, during which both he and his assistant received slight autopsy wounds on the hand. On the same night Dr. Froelich had pain about the wound; on the

¹ Medical News, January 8, 1887, p. 44.

² Ibid.

³ Ibid.

⁴ Medical Record, November 27, 1886.

⁵ Ibid.

⁶ Deutsche med. Zeitung, viii. 1887.

following day he had lymphangitis of the arm with swelling of the axillary glands. On the second day the tonsils became affected with follicular tonsillitis. The assistant passed through a similar train of symptoms, only that the onset was two days later. Dr. Froelich's wife was also taken ill with tonsillitis. All made a good recovery.

I had one case in which, I think, infection took place in a similar manner: On October 10, 1887, Ullrich B., a brewer, was taken ill with an acute attack of follicular tonsillitis; on the evening of the 14th he was visited by Conrad P., a fellow-workman. While cutting some plug tobacco Conrad cut himself in the hand, and "took hold of the nearest thing to him to wipe away the blood;" this thing happened to be Ullrich's handkerchief. On the morning of the 16th I was sent for, and found Conrad suffering from an acute attack of follicular tonsillitis, and complaining of pain in the left axilla. His axillary glands were swollen, and he gave a history of two severe chills the evening before. Ullrich B. recovered on the 16th and Conrad on the 20th. The onset in Conrad was quite severe; his axillary temperature on the sound side, when I first saw him, was 103.7° F.

TEMPERATURE.—The axillary temperature at the onset in my cases ranged from a little above normal to 104.5° F.—generally between 101° and 103° F. In those cases in which the temperature was low at the onset it generally rose from 1° to 3° on the second or third day.

PULSE.—In most cases the pulse was full and rapid; but I had three cases in which it was rapid and quite feeble.

DURATION.—The longest uncomplicated attack that I saw lasted seven days; the shortest, two days. Three and a half days was the average.

COMPLICATIONS.—*Albuminuria* is often present in febrile diseases with high temperature, and so it is in tonsillitis. I met with it five times in my 43 cases. Actual renal trouble—acute nephritis—I saw once. (The case of the little boy I mentioned in the beginning of this paper is not included in this study of 43 cases.)

Joseph H. was taken sick March 6, 1888, with acute tonsillitis. On the 9th, feeling better, he went out without my permission, and as a result of this indiscretion had a relapse of his trouble. His temperature on the morning of the 10th was 104.5° F., two degrees higher than on the first day of his illness; the constitutional disturbance was very much greater. On the 15th I noticed puffiness of the lower eyelids and œdema of the legs. His urine was again examined, and found loaded with albumin. There was no heart trouble. I put my patient on Basham's mixture and Buffalo lithia water; by the 22d all dropsy had disappeared and on the 25th the urine contained no trace of albumin.

Here, then, is a case of acute Bright's disease complicating tonsillitis, and that nothing more than tonsillitis was present was shown by the fact that follicular tonsillitis was communicated to the patient's wife, who

ran through her *first* attack in four days, from the 12th to the 15th of March. Further, the only child of this couple, aged fifteen months, being confined, during the mother's illness, in the same room with its parents, was also taken sick, on the 15th. There was nothing more than considerable congestion of one tonsil; the temperature was 101° ; and by the evening of the 17th all local signs of trouble had disappeared, but fever was still present and the child was very fretful. Examination on the morning of the 18th revealed all the signs of the first stage of lobar pneumonia; the lower lobe of the right lung was affected. The child went through all the stages of pneumonia, and did not fully recover until April 11th. Now, whether the pneumonia of the child had any connection with the tonsillitis of the parents, or not, I do not know. Anyhow, on the 29th of March, its mother, who had been very attentive to it and was constantly about it, was again attacked with tonsillitis which ended fatally on the night of April 3d. The cause of death was œdema of the epiglottis.

Dr. S. Seabury Jones¹ reports a case of abscess of the lung, non-tubercular and non-metastatic, in which suppurative tonsillitis was the initial lesion.

Heart. Dr. Haig Brown² mentions that, of 345 cases of acute tonsillitis in which there was no history of previous rheumatism, 33 developed a cardiac murmur. Of these cases, 8 were systolic basic murmurs heard over the pulmonary artery; 18 were systolic basic murmurs; 2 were pericardial friction murmurs; 1 had pericardial friction with systolic apex and diastolic basic murmurs; 4 were combined systolic and pre-systolic bruits. Eight of the cases of endocarditis terminated in chronic valve disease.

I had two cases in which a systolic apex murmur was developed; both disappeared—one in two weeks and the other in four weeks. Both cases were females; in both was the invasion of the tonsillitis severe. In one case the signs of tonsillar trouble disappeared on the fourth day; this was the case in which the heart murmur persisted for four weeks. In the other case the tonsillitis lasted six days. Neither had had rheumatism. Moreover, I have now under my care a case of mitral insufficiency in a lady who has no history of any previous sickness except tonsillitis.

Orchitis and ovaritis. I have met with neither of these complications. Joal,³ a French observer, in a study of the subject, sums up as follows: (1) Orchitis and ovaritis should be classed among the complications of acute tonsillitis, either superficial or deep. (2) These genital manifestations, analogous to those which appear in typhoid fever and mumps, should be attributed to the infectious nature of the tonsillar inflamma-

¹ Medical News, March 2, 1889, p. 247.

² Ibid., January 8, 1887, p. 44.

³ Archiv. Gén. de Méd., i. 1886.

tion. (3) The orchitis and ovaritis are not due to any of the alleged physiological sympathies imagined by certain authors as existing between the generative organs and the tonsils.

Typhoid fever. De Gassicourt¹ reports three interesting cases in whom tonsillitis was the first symptom of typhoid fever. One case, a boy, thirteen years of age, vigorous and, when first seen, delirious. The pulse was rapid, the skin hot, the submaxillary glands swollen, and the tonsils and soft palate covered with a yellowish-white exudate. While he was in doubt as to the diagnosis of diphtheria, symptoms of typhoid fever developed, and the patient died on the twenty-fifth day. The other cases were children in whom the tonsillitis was quite severe, and terminated in a moderately severe typhoid fever; both patients recovered.

Peritonitis. Froelich² reports a case in which peritonitis complicated tonsillitis.

Rheumatism. I had one case, a boy, eleven years old, in whom all the symptoms of acute rheumatic fever developed during an attack of acute tonsillitis; he gave no history, either personal or family, of rheumatism. The invasion of the tonsillitis, in this case, was quite severe; his temperature 103°; his pulse full and rapid, and the skin hot. On the third day of his illness he complained of pain and swelling in the right knee, and on the fourth day in the left knee. He had profuse perspiration, and the urine showed a reddish sedimentary deposit on standing. He was put on salicylate of soda, and on the tenth day he had fully recovered.

Glandular tumefaction. In three of my cases, uncomplicated, there was enlargement of the submaxillary glands.

Edema of neighboring tissues. The occurrence of œdema of the glottis, epiglottis, the soft palate, and uvula is known, and some fatal cases are reported. I had one fatal case of œdema of the epiglottis.

It was the case of Mrs. H., who had two attacks of tonsillitis within three weeks; in the second attack the tonsil suppurated, and was spontaneously evacuated, much to her relief, on the morning of the sixth day. (I was not allowed to use a bistoury.) That night she and her husband sat up late, both in good spirits; at twelve P.M. she took a dose of her medicine, a resin guaiac mixture; she had hardly swallowed it when she cried out that she was choking. Her respiration was at once labored, and in a minute more inspiration was impossible; with each expiration she cried out, and in two minutes more breathing ceased altogether.

All of this happened in the presence of her husband, an intelligent man, from whom I got the history. As soon as he could, he sent for me, and when I arrived at the house she had been dead thirty minutes; her extremities were cold, and she was beyond all hope of resuscitation.

¹ L'Union Médicale, March 15, 1888.

² Deutsche med. Zeitung, viii. 1887.

Putting my finger in her mouth, I could feel, at the base of the tongue, the immensely swollen epiglottis.

There are several cases on record in which the tonsillar abscess burst during sleep, causing alarming symptoms of suffocation. Dr. Way¹ reports one fatal case. Examination after death revealed the fact that the upper pharyngeal region and the larynx were filled with pus and broken-down tonsillar tissue.

Several cases are also reported where spontaneous evacuation of tonsillar abscess was accompanied by severe hemorrhage. Poshensky² reports a case in which ligation of the common carotid artery was necessary to stop the bleeding. Hall³ reports a fatal case of hemorrhage in a man of twenty-six. This man had suffered from repeated attacks of suppurative tonsillitis, and Hall believes that the walls of the carotid were weakened by the process of ulceration.

DIAGNOSIS.—*Scarlatina*. In the commencement of scarlet fever, prior to the eruption, there are no symptoms or appearances which enable us to make a positive diagnosis. Still, history of exposure to scarlet fever, and vomiting, which is rare in tonsillitis, should leave little doubt as to the nature of the case before us. Later, the appearance of the rash and the characteristic appearance of the tongue make the diagnosis certain.

Diphtheria. The diagnosis from diphtheria, when the membranous deposit spreads from the tonsil to the soft palate, uvula, and pharynx, is easy; but when the diphtheria remains tonsillar the differentiation is very difficult, and especially so in the variety known as punctate diphtheria.

In tonsillar diphtheria, as in acute tonsillitis, the invasion may be abrupt, with high fever and a full and rapid pulse. There may be no glandular enlargement behind the angle of the jaw; there may be no albuminuria; the deposit may have a yellowish tinge; but, while it may prove an innocent affair, as far as the person affected is concerned, it can spread most violent diphtheria. This has happened to me. In a case that I had, the abrupt invasion; the initial high temperature; the absence of glandular tumefaction and albuminuria; the patient, a boy, showing no tendency to asthenia, and the yellowish color of the deposit, made for me the diagnosis of tonsillitis, and no attempt was made to isolate the case. This case brought on ten cases of violent diphtheria in his own and two neighboring families, seven of which died.

The differentiation between the two diseases is made in the following manner: in follicular tonsillitis the exudate can usually be brushed away; when it becomes dry and membranous in appearance it can

¹ Medical Record, Feb. 25, 1888.

² Annual of Univers. Med. Sciences, 1888, vol. iii. p. 292.

³ Boston Med. and Surg. Reporter, Dec. 22, 1887.

easily be detached with a forceps, whereas a true membranous deposit is adherent and, if forcibly detached, leaves a raw, and very often bleeding, surface. In those cases in which the deposit is punctate and where it cannot be wiped away: in the follicular cases a probe can be made to enter the lacunæ of the tonsil, between the exudate and the wall of the lacuna; in the true membranous cases, the membrane being adherent to the wall of the lacuna, this is impossible.

In view of the difficulties attending a correct diagnosis, I am inclined to decide with those writers who think it better to err on the safe side and isolate all cases of follicular tonsillitis as if they were cases of diphtheria.

The fact of the occurrence of tonsillitis during epidemics of scarlet fever and diphtheria, and that when we have much tonsillitis we will meet with cases of scarlet fever and diphtheria, is very interesting, and leads some authors to the opinion that there is a certain relationship between tonsillitis and the two specific fevers. Fox¹ says: "There is some reason for regarding scarlatina and diphtheria as essentially forms of tonsillitis which have acquired the power of infecting the system generally. The virus of these two fevers may probably enter the lymphatic system through the tonsil, producing tonsillitis as a primary effect. He thinks "there is nothing in the occurrence of scarlatina and diphtheria of wounds, and of mucous surfaces other than the fauces, to contravene the hypothesis that the poisons of these diseases in ordinary cases enter at the tonsil."

Herpes of the tonsil. Mild herpetic angina, in which the eruption is limited to the tonsil, is extremely rare, and when it does occur it should offer no difficulty in diagnosis—the vesicular eruption is characteristic.

Primary sarcoma of the tonsil. Two cases of this affection have been reported this year, one by Dr. MacCoy,¹ the other by Dr. Gray.² Gray collects eighteen cases reported since 1869. MacCoy calls attention to the "want of distinctive features while the tonsil alone was involved, having all the appearances of a tonsillar inflammation." Croly³ reports two cases which were first treated as tonsillitis.

A case of tonsillar trouble, having the appearance of mild tonsillitis, without fever and without much constitutional disturbance, persisting for a week or more, should excite suspicion, and the aid of a microscope should be used to make a diagnosis.

Chancre of the tonsil. This might be mistaken for tonsillitis. The appearance of a sore on the tonsil with early enlargement of the glands at the angle of the jaw is diagnostic. These cases generally happen in

¹ Lancet, ii. 1886.

² Med. News, Feb. 2, 1889.

³ AMERICAN JOURNAL OF THE MEDICAL SCIENCES, ii., 1889.

⁴ Transactions of Academy of Med., Ireland, v. 1887.

those who are in the habit of using the same pipes, eating and drinking utensils with others suffering from syphilis.

TREATMENT.—The treatment of tonsillitis may be divided into prophylactic, local, and constitutional. The *prophylaxis* of tonsillitis has special reference to the treatment of those cases of hypertrophied tonsils which take on frequent attacks of acute tonsillitis. Indeed, all enlarged tonsils are specially liable to attacks of the inflammation. An interesting fact may be mentioned in this connection: Out of 2000 children examined by Dr. Chappel¹ in New York City to determine the frequency of certain abnormal conditions in the throat and nose, 270, or 13½ per cent., had enlarged tonsils, and then only those presenting very considerable enlargement were noted.

The usual treatment for enlarged tonsils is tonsillotomy, either with the bistoury or with the tonsillotome. This operation is comparatively easy, but the reports of cases of alarming and obstinate hemorrhage after it are not so rare as to encourage the belief that it is simple and free from danger. The treatment that has received the strongest recommendation of late is that by the galvano-cautery; this can be applied in two ways: with the galvano-caustic snare, or with the sharp-pointed electrode.

The *écrasement* with the caustic snare requires some skill; care must be taken that the platinum wire is closely adjusted to the tonsil; that all of the gland that is to be removed is not included, and that the heated wire does not come in contact with the pillars of the fauces or other parts. These precautions are necessary, because the heated wire will cauterize that part of the gland that remains, and because burning of the other tissues of the throat will cause intense pain and may give rise to considerable œdema. A No. 30 platinum wire is the best to use; it must be heated to red-heat, and must only be tightened during the passage of the current.

The treatment with the sharp-pointed electrode, igni-puncture as it is called, though not so rapid as with the snare, has these advantages over it: (1) It is more easily managed, and (2) it causes a great deal less pain, and none after the preliminary application of a 4 per cent. solution of cocaine. The application is simple: under red-heat the electrode is plunged into the tonsil to the depth of a quarter of an inch, held there for a moment and then withdrawn. A second and third puncture may be made at the same sitting; four to seven days must elapse between the sittings, and from three to five sittings will be necessary to contract the tonsil.

The after-treatment after each sitting, and after the use of the snare,

¹ AMERICAN JOURNAL OF THE MEDICAL SCIENCES, ii., 1889.

consists simply in the use of alkaline gargles. Seiler¹ prefers, when the tonsil is hard, the use of the Jarvis snare; he adjusts the wire over the tonsil himself and gives the instrument over to the patient, who does the tightening. In this manner the operation is done with but little loss of blood; the patient, to save pain, operates slowly, taking from two to three hours to complete the operation.

Von Hoffman² holds that hypertrophy of the tonsil is due to the conversion of the lacunæ into cavities filled with viscid secretion and pus. He claims to have good results by tearing these cavities open with a tenaculum.

The results obtained by the use of injections of caustics and astringents into the hypertrophied tonsils are not so satisfactory as the results obtained by the employment of other means.

Local treatment. The application of the alkaline salts, as borax and sodium bicarbonate, either in warm solution as a gargle, or in powder, to the inflamed tonsil is strongly recommended by Baker³ and Oliver.⁴ LeBrun⁵ uses a gargle composed of boric acid 8 parts, Eau de Pagliari 40 parts, and water 250 parts, and follows this up with the application to the tonsil of iodoform collodion. Morell Mackenzie⁶ uses bismuth and opium, or $\frac{1}{8}$ gr. of morphia with $\frac{1}{4}$ gr. of starch, locally; later in the disease he gives inhalations of benzoin, hop or conium, and applies poultices to the outside of the throat. As soon as he finds fluctuation, he makes an opening into the abscess. Von Hoffman⁷ wraps a wad of cotton as thick as a little finger around the point of a dressing forceps; dips this in a mixture of equal parts of tincture of iodine and glycerine and with it applies pressure (squeezes) to the tonsil, which is supported by a finger on the outside. He says this method causes some (?) pain, but the relief obtained is so great that patients will ask for a repetition of it.

Cocaine has been applied to the tonsil to relieve pain and to diminish the blood-supply. De Haviland Hall⁸ sprays the throat with a solution of sodium bicarbonate, 10 grs. to the ounce; and then applies a 20 per cent. solution of cocaine to the tonsil; this is repeated in ten or fifteen minutes if no relief is obtained from the first application. The applications are made from one to three times a day as long as the patient is sick. In view of the toxic qualities of cocaine, I would look upon this treatment as dangerous.

¹ New York Med. Presse, June, 1888, p. 285.

² Medical News, Nov. 26, 1887.

³ Annual of Univ. Med. Sciences, 1888, vol. iii. p. 289.

⁴ Ibid.

⁵ La Clinique, i. 1887.

⁶ Medical News, January 26, 1889.

⁷ Medical News, November 26, 1887.

⁸ British Med. Journal, i. 1888.

The only local treatment that I use, and with good results, consists of poultices to the outside of the throat, inhalations of steam, and incision when there is abscess.

Constitutional treatment. The use of the tincture of aconite root, the ammoniated tincture of guaiac, and potassium chlorate with tincture of iron is so well known that it need not be mentioned here. Morell Mackenzie¹ insists that he has better results from the resin guaiac in powder (lozenge) form than in the tincture form. Sodium salicylate, 15 to 20 grains every three or four hours, is strongly recommended. I use it in rheumatic cases with decided benefit.

Boisliniere² strongly recommends the sodium benzoate; he reports seventy-five cases in which he simply gave the following mixture:

R.—Sodium benzoate	.	.	.	.	.	.	3j-3iv.
Glycerine.	}	.	.	.	.	.	āā 3j.—M.
Elixir calisaya bark		.	.	.	.	.

D. Sig.: 3j every hour, or every two hours.

Of the 75 cases, 41 reported well in twelve hours, 31 in twenty-four hours, 3 in thirty-six hours; average, twenty hours. In private practice, when cases could be watched more closely, he has seen the white cheesy points disappear in from eight to ten hours. He finds that sodium benzoate undoubtedly controls the febrile elements in the disease; that it may be given with impunity even to children, and that it produces no bad or disagreeable effects.

This is, indeed, a brilliant showing, but in my hands the remedy has done no better than any of the others that I have used. I tried it in 10 cases; 3 reported well in two days, 2 in three days, 4 in four days, and 1 in six days. Average, three and one-half days—just about the same results that I get from any other remedy.

I am very sceptical as to the curative or abortive power of any remedy in acute tonsillitis; I believe it to be a specific disease which will run an average course of three and one-half days, in spite of all we can do for it. I can recall two cases in which nothing but poulticing and steam inhalations was done, and both recovered fully by the fourth day. In one case my prescription had not been filled; in the other, a servant girl, the medicine was thrown regularly in tablespoonful doses into the water closet. Remembering this, I, in my own case (last winter), did nothing but make myself as comfortable as possible, and on the fourth day I was well.

¹ Medical News, January 26, 1889.

² Ibid., March 3, 1888, p. 237.

A CONTRIBUTION TO THE MANAGEMENT OF INITIAL MYOPIA ACQUISITA.¹

BY S. O. RICHEY, M.D.,

OF WASHINGTON, D. C.

THE emmetropic, or the non-progressive slightly myopic, eye is best suited to the occupations of civilized life, because it has most endurance when taxed by objects within the limit of distance at which rays of light sensibly diverge. Hyperopia is the typical refraction; "the refraction of neonati is exclusively hyperopic."² That this condition persists, or changes but slightly, in the lower animals and in human beings who lead an out-door life, away from occupations requiring precise ocular attention to objects within the length of the arm; that the refraction increases with the years of an individual up to twenty-five, and beyond, if he be engaged continuously with small objects near him, are points established by statistics.

The hyperopic eye, unlike the emmetropic or myopic eye, is to a greater degree a vital organ, rather than an optical machine arranged for a given class of work. It has more life and adaptability, adjusting itself for the *best* definition of images at different distances and of varying sizes. Objects appear more brilliant to it—because, it accommodates for *every* object at whatever distance, and the ciliary muscle is better developed by this constant exercise; and because, with this constant effort at accommodation are associated movements of the choroid and retina, the perceptive elements being thus kept in a constant state of healthful tension. Objects are smaller and brighter, and more clearly defined.

A hyperope can see farther and more accurately when the atmosphere contains more than the usual amount of moisture, or in a fog; myopic vision is increased by such conditions.

Nature did not build eyes for vision limited to twenty feet, though she adapts, or endeavors to adapt, them to the uses to which they are subjected. Hence, the increasing tendency to myopia in civilization, for the percentage of myopia in a given race is an approximate measure of its civilization. The myopic eye can work in a *lower* illumination on account of the apparent size of the objects, which it magnifies.

Myopia and chronic nasal catarrh are *vestigia* of luxury. Houses exclude light, distance, and cold air; the handkerchief is limited to the civilized human being.

How does nature, in her effort to adapt the human eye to its environ-

¹ Read at the meeting of the American Ophthalmological Society, July 18, 1889.

² Koenigstein, Wien. med. Journ., p. 47, 1881.

ment, change hyperopia into myopia, or myopic astigmatism? This is the question with which this paper will attempt briefly to deal; for, with a clear conception of the *modus operandi* of structural changes, we have positive indications for the prevention of such processes.

In accommodation, the ciliary muscle, by its contraction, advances the choroid, and with it the retina. This action of the muscle has been observed through a sclero-corneal incision opposite the muscle, and also by the swaying of the heads of pins stuck perpendicularly into different parts of the choroid (Hensen and Voelckers). This movement of the choroid increases the pressure of the corpus vitreum on the lens: the lens is carried against the iris, which being contracted offers resistance to the lens, except in the pupillary space where the lens becomes most convex. Whether the lens becomes more convex by its own elasticity during relaxation of the zonule, or, whether the circular fibres *press* by their ciliary processes on the equator of the lens (Müller), it is unnecessary to the purpose of this discussion to decide. We are also to exclude that class of myopia into which inherited tendency enters as a factor, so far as this is indicated by its existence in some progenitor, and limit our consideration to the action of the most potent cause of myopia, *ab initio*.

Among civilized people the objects which engage their attention from earliest childhood are, for the most part, included within the four walls of a room; generally within reach of their hands. After having fixed the mode of production of myopia, it will be proper to decide if it be best to *prevent* it, that being possible; if it be best to prevent entirely our adaptation by nature to our changed environment, or to limit only this process of adaptation. This is a question to be studied and discussed in the interest of coming generations, with a view to its settlement by ourselves, or others.

A slightly myopic eye seems best suited to the needs of present training, and trained occupations, though it would not have been so effective in the pastoral and nomadic modes of life of the past. It is better suited to a race of students and to kindred employments. The danger lies in the too rapid enforcement of the structural changes necessary. If these could be limited in the individual, and reach proper development slowly through several generations, each one bearing its own share of the adaptation, disease processes might be avoided, and, with this, the inherited tendency to certain affections of the eye. No one organ can be good for everything. The hyperopic eye was perfect for its uses in the past, but it has, in a measure, given way to the so-called emmetropic eye, which must in turn be superseded by the eye of still higher refraction, with the least damage from the process.

The hyperopic eye always exercises some accommodation to secure definition of image, even at infinite distance, and the demand upon accommodation increases in inverse ratio to the size and distance of the

object. Such eyes are rarely at rest. The anatomical peculiarities of the region supplied by the trigeminus are not fixed until after the period of second dentition, during which the greatest exactions are made upon it by our methods of education and preparation for the future duties of life. Tonic ciliary spasm simulating myopia, or myopic astigmatism, is not infrequent. Schweigger says myopia is often developed in children after measles, or scarlet fever; diseases which offer a legacy of muscular asthenia predisposing to muscular spasm of taxed muscles, of which the ciliary muscles are most prominent, as during convalescence they are most relied upon for amusement.

Constant and excessive action of the ciliary muscle causes disturbance in the uveal tract by the continuous motion of the choroid, with the alternate compression and relaxation of the bloodvessels resulting from it. The advancement of the choroid and corpus vitreum means an increase in the antero-posterior diameter of the bulb. With this state of things persisting while this whole region is adapting itself during the period of second dentition and diminished general vigor, especially after the exanthemata, is it surprising that the eye should become fixed with an abnormally long antero-posterior diameter? This shape and position having been maintained for some months the tissues lose their resiliency, and when the spasm is relaxed, the eye does not promptly, if ever, recur to its former condition. This mishap occurs too upon the threshold of the sexual life, when the slightest influences have an exaggerated and permanent effect. The myopic process begun at this time is with difficulty interrupted, though it may sometimes be limited by prompt and decided measures, unless in case of inherited tendency.

Irritation of *one* ciliary nerve may cause contraction of the ciliary muscle and the iris, and the advancement of the choroid and vitreous body in the *one* section to which it is distributed. Thus, astigmatism may be inaugurated. To object that astigmatism depends upon asymmetrical curvature of the cornea, is to lose sight of the fact that when the vitreous is advanced it is probably narrowed, that the shape of all the tissues is modified, the cornea as well as the rest.

If the, at this time, temporary malformation of the bulb, and the associated uveal excitement, are not restored to the previous conditions, the prospect of recovery grows less, and inflammatory disturbances of the fundus may supervene.

The means at our command for the accomplishment of this purpose are simple, based upon the rational indications, and have been found effective. If not all elasticity of the tissues is lost by delay, the persistent use of atropia in suspending accommodation will permit a recurrence to the earlier refractive power; and, by the rest it affords, relieve the choroido-retinal perturbation. A solution of atropia, 1 : 120 parts, should be used, one drop in each eye, every second, third, or fourth day, *pro re*

nata; combine with this a London-smoke + lens, as strong as is tolerated, to be worn, and for a necessary time all near-work must be suspended. Some months are required to gain the best effect, which is the chief impediment to success. The true American, the child as well as the adult, living in the same atmosphere of nervous excitement, and impressed with an exalted idea of the importance of what he is endeavoring to do and the short space of time in which it must be done, has no appreciation of the conservation of energy. He has a life to live, and wants to get through with the *business*. He looks upon physical integrity as an accomplishment, rather than important to the real purpose of life. He is very impatient of time *lost* in securing to himself the physical advantages already possessed, and will probably more than once infringe the rules given for his guidance and risk the success of the effort made in his behalf. After the *best* effect of the mydriatic has been secured it may be suspended, the length of time the eyes may be used is arranged, the strongest + lens through which the individual can read at 36 cm. distance is prescribed, and he is to be forbidden to approach the object more nearly. He is to read nothing that cannot be easily seen at the given distance with the lens. This plan, repeated as necessary, will establish the improved condition, in a length of time varying with different individuals.

I hereto append a few cases in point:

CASE I.—*June 19, 1882.* Miss M., aged thirty-two. Since 1876 has noticed that she could not recognize acquaintances across the street. Has had pain in her eyes for four months. Her vision is worse after concentration for a time upon some near object; has decided photophobia and often congestion of the bulbar conjunctiva. V., each = $\frac{20}{cc}$. Reads Jaeger's No. 1, easily with either eye, at 12 in. With — 3 Ds., V., each = $\frac{20}{xx}$. A solution of atropia, 1 : 240, and a + .5 Ds. lens for reading were prescribed to relax A. (as has since been suggested by Landolt in his work on *Accommodation and Refraction of the Eye*).

August 1. + 1. Ds. each was prescribed, and the atropia was continued.

August 10. V. each = $\frac{12}{c}$.

January 11, 1883. Under this treatment continued V., each = $\frac{20}{c-}$.

November 12. No farther improvement, and — 1.75 Ds. were prescribed for distance, giving V., each = $\frac{20}{xx}$.

July 16, 1884. I examined the eyes again with the same result.

Six years is a long time for tonic spasm of the ciliary muscle to exist without some structural change, which had taken place in this case, probably. After thirty, the tissues naturally have less elasticity than

earlier in life. The patient was a government employé and was compelled to continue desk-work during the treatment. These three facts may explain why success in this case was not better even than it was.

CASE II.—*July 29, 1882.* F. C. H., aged twenty, a student of civil engineering, complains of nothing except indistinct vision for distant objects. V., each = $\frac{20}{LXX}$; with — 2 Ds., each = $\frac{20}{XX}$. Reads Jaeger's No. 1 at 21 in., and at 5 in.

He was seen at intervals until February 4, 1884, and under the treatment carried out as well as possible while the young man was attempting to keep up with his class, with — 1.25 Ds., V., each = $\frac{20}{XX}$.

July 22, 1884. The same condition existed. His mother is a myope.

CASE III.—*February 3, 1886.* F. L. H., a schoolboy of twelve years. He is small, and does not look strong, though ordinarily vigorous by report. He is very fond of books, and reads nearly all the time in bad light and in awkward positions. Distant objects "are blurred; not clear as they used to be." V., each = $\frac{20}{XX-}$. Prescribed — .75 Ds., for distance only, with instructions to maintain *always* a distance of fifteen inches from his book, to read in a good light, not lying down.

October, 1888. He returned with V. R. = $\frac{20}{LXX-}$; V. L. = $\frac{20}{LXX-}$.

V. R. =, with — 1.25 Ds., $\frac{20}{XX}$.

V. L. =, with — 1. Ds., $\frac{20}{XX}$.

Subjected to the course of treatment indicated, with cold-water douche to the eyes, he has gradually improved as the following tests declare:

Nov. 10. V. R. = $\frac{20}{L}$; 20th, = $\frac{20}{XL}$; *Dec. 22,* = $\frac{20}{XXX}$; *Jan. 19,* = $\frac{20}{XX}$

" V. L. = $\frac{20}{L}$; " = $\frac{20}{XL-}$; " = $\frac{20}{XXX}$; " = $\frac{20}{XX}$

February 1. The atropia was suspended, while the + .5 Ds. lenses were continued, but February 9th, having recovered from the influence of the mydriatic, V. was slightly blurred.

July 1, 1889. The result of the test, V., each, $\frac{20}{XX}$.

CASE IV.—*June 16, 1888.* W. W., aged seventeen years, consulted me in great distress. He had been rejected, upon a physical examination for West Point, the Examining Board having reached the conclusion that there was myopic astigmatism of the right eye, and myopia of the left eye. Upon examination, V. R. = $\frac{20}{LXX}$; V. L. = $\frac{20}{XX-}$. Jaeger's No. 1 could be read easily at 12 inches. After the instillation of atropia he was again examined.

18th. V. R. = $\frac{20}{LXX}$; 19th, $\frac{20}{LXX}$; with — 1. Ds. = $\frac{20}{XX}$; 26th, = $\frac{20}{XXX}$

" V. L. = $\frac{20}{XXX}$; " = $\frac{20}{20}$.

The last part of July, V. R. = $\frac{20}{xx}$, under the continued treatment.

He was advised to abandon his intended plan of going to West Point, because the integrity of his eyes could not be preserved under the exactions to which they would be subjected there, and he would be rejected at the close of his term. This course was followed, and he has since been studying at home.

September. V., each = $\frac{20}{xx}$. He used his eyes in a bad light, and in

December, V., each = $\frac{20}{xx-}$.

February 19, 1889. He has been using his eyes six or eight hours daily since early in December, in reading, maintaining a proper position and with a good light, without manifest disadvantage. V. = $\frac{20}{xx-}$, each.

The father had hyperopic astigmatism of both eyes. An elder brother, whom I examined in June, 1883, when near the end of his course at the Naval Academy, at Annapolis, had a compound myopic astigmatism of about 5 D., which I suspect has increased. Of two sisters, the elder at eighteen years was myopic: R. E. = 2. D.; L. E. = 1.25 D. The younger, October, 1882, eight years old, was hyperopic, 1.25 D., and during the more than six years that have elapsed, the refraction has not varied. She has been going to school during this time, and has been under my observation. She has worn a correcting glass, read in proper position, and maintained the proper distance between her eyes and her books. She has developed well, though she had grown so slowly until she put on lenses that her parents feared she would be dwarfed. The influence of the glasses was proven by the prompt growth of the child immediately upon their adaptation.

The relief, and the gain in general nutrition and strength, afforded by the timely use of proper convex lenses in hyperopia show the exhaustive effort required of the ciliary muscle by our civilized surroundings. Unless some rational and systematic mechanical method is adopted in anticipating and avoiding the evils which result, nature will compensate for the continual demand upon the ciliary muscle, by modifying the eye to suit the altered conditions, in order to save the rest of the body from exhaustion, and from the arrest of development arising from overtaxing one set of muscles at the early age at which our children are subjected to our forcing educational methods.

Shall we interfere by artifice with nature's process in adapting the eye of the Past to the needs of the Present, until what is best can be settled? Or, shall we permit the young to drift into danger from progressive myopia, and the evils it entails upon themselves and their posterity by inheritance?

A concave glass is only an attempted compensation for mischief accomplished in part, or in whole.

A CASE OF MODIFIED LARYNGECTOMY FOR EPITHELIOMA OF THE LARYNX ; RECOVERY.

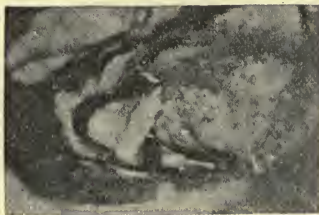
By GEORGE R. FOWLER, M.D.,

SURGEON TO THE M. E. HOSPITAL, AND ST. MARY'S HOSPITAL, BROOKLYN, N. Y.

On November 12, 1888, Mrs. C. D., aged fifty-eight, married, was admitted to my service at the M. E. Hospital, with the following history : For the past two or three years the patient has noticed a gradual and progressive hoarseness. Five months preceding admission, she first consulted me for the relief of this hoarseness, which very shortly thereafter amounted to complete aphonia. Laryngoscopic examination at this time revealed a neoplasm upon the anterior portion of the left vocal cord, and I referred her to my friend, Dr. T. R. French, of this city, for further examination and advice concerning the necessity for an immediate operation for the removal of the growth. He confirmed my diagnosis of malignant disease of the larynx, and agreed with me in the desirability of attacking the growth and that the extra-laryngeal method of operation was the only one justifiable under the circumstances.

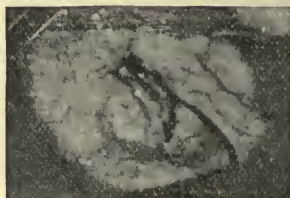
She returned to her home in the country to make preparations for the operation, intending to return in the course of a fortnight. During the next few months I heard, through a friend, that a decided improvement had taken place in her voice, and that, encouraged by this fact, she hesitated before accepting my advice. I requested that she return to the city, in order that another examination be made, to which request she acceded, and in November she again visited Brooklyn, and allowed me to re-inspect her larynx. It was then found that the growth had considerably increased in size, the visible portion projecting well beyond the free margin of the vocal cord, and occupying most of its length.

FIG. 1.



Showing parts during ordinary respiration. (Hemi-tone, after a photograph by Dr. T. R. French.)

FIG. 2.



Showing parts during phonation. (Hemi-tone, after photograph by Dr. T. R. French.)

The improvement in the voice was evidently due to the fact that, whereas, when the aphonia was complete, the left vocal cord was so crippled by the growth that its function was practically abolished, later on, as the growth increased in size, the right vocal cord could be brought into contact with the former, and thus phonation was reëstablished.

Dr. French again examined her at this time, and succeeded in photographing the parts as they appeared, both in ordinary respiration and

in phonation (Figs. 1 and 2). It was decided to give her the benefit of an extirpation of the larynx by the modified procedure suggested by Prof. J. Solis-Cohen, of Philadelphia, but which, up to this time, had never been performed upon the living subject.¹ Accordingly, on November 13th, the day following her admission to the hospital, a low tracheotomy was performed, preliminarily; in order to accommodate an extra large sized tracheotomy canula, an oval piece was removed from the front wall of the trachea. A few superficial sutures were applied, in order to close the wound below the tube. The parts were dressed with an artificial cuticle of collodion and sub-iodide of bismuth.

On November 17th, four days following the tracheotomy, it being found that complete toleration of the presence of the tracheal canula had been established, the operation of modified laryngectomy was performed in the presence of Prof. J. Solis-Cohen, Drs. T. R. French, B. F. Westbrook and Bryson Delavan, together with the hospital staff. The anæsthetic used was nitrous oxide, administered by Dr. George W. Brush, of this city. The method of administering the anæsthetic was by means of a coupling made to fit the opening of the tracheal canula, and attached by a piece of flexible tubing to the ordinary inhalation apparatus of the dentists. Inasmuch as the operation differed in one or two particulars from the procedure suggested by Prof. Solis-Cohen, I have thought it best to describe the different steps of the operation in this the first application of the new method. The operation as performed by myself is as follows:

An incision was made from the upper border of the hyoid bone to the first ring of the trachea. This was afterward extended to the tracheotomy wound. The structures overlying the thyroid were separated from about one-half to three-quarters of an inch on either side of the angle of junction of the two wings of this cartilage; the isthmus of the thyroid body was divided with the thermo-cautery. The crico-thyroid muscles were divided near their attachments to the thyroid cartilage, the soft parts were retracted to either side, when, all hemorrhage being arrested, the cricoid cartilage was separated from the first ring of the trachea by a transverse incision. The stump of the trachea was drawn forcibly forward and rapidly packed with gauze by an assistant, while the cross incision was being made. A silk ligature was passed through the first ring of the trachea and tied in a loop, in such a manner that the stump of the trachea could be drawn well forward. By means of narrow-bladed angular forceps each wing of the thyroid was split down to the crico-thyroid membrane at a point about one-quarter of an inch on either side of the angle of junction of the two wings. The interior structures of the larynx were now cleared from the inner surface of the thyroid cartilage; the mucous membrane of the right side peeled off easily, but that on the left side proved to be hard and somewhat unyielding, although it finally separated completely from the underlying thyroid. It was then readily ascertained that the growth occupied this portion of the interior of the larynx, being moulded to the shape of, but not involving the interior surface of the corresponding wing of the thyroid. Both wings of the cartilage being cleared, the soft parts behind and to the sides of the cricoid, including the articulation of the latter

¹ New York Medical Journal, vol. xlv. pp. 682, 683, 1887. Transactions American Laryngological Association, 1887, New York, 1888, ix. 38-40.

with the inferior cornuæ of the thyroid and its connection with the œsophagus, were separated; the attachments of the inferior constrictor muscles of the pharynx to the posterior portion of the thyroid cartilage were not interfered with. The arytenoid cartilages were included in the parts thus dissected. Upon reaching the line of the attachment of the œsophagus to the cricoid posteriorly, the former was opened in the median line, and through the opening thus formed the index finger of the operator's left hand was passed into the pharynx up to the base of the tongue and hooked over the epiglottis. The latter, together with the entire respiratory contingent, was now forcibly drawn downward, so as to identify the attachments of the thyro-hyoid membrane. The latter was now incised, and the epiglottis detached from the aryteno-epiglottidean folds, when a few touches of the knife served to release the whole mass from its remaining attachments.

It was found that the entire diseased mass had come away completely. After ligating a few bleeding points, the stump of the trachea was repacked with dry gauze, and an œsophageal tube was passed about eight inches down the œsophagus, and the parts above and below the section of the gullet, as well as the neighborhood of the feeding tube, as it passed into the latter, were well packed with oxide of zinc gauze; the latter reached well up into the pharynx above the base of the tongue. A large safety-pin was passed crosswise through the œsophageal tube to prevent the latter from slipping into the stomach.

The patient left the table, fully conscious, within a minute after the completion of the dressings and without the slightest symptom of shock, although the anæsthesia by nitrous oxide had been maintained steadily and without the least difficulty for an hour and forty minutes by Dr. Brush. Indeed, had she been allowed to, she would have walked to her room from the operating theatre.

On the following day the dressings were removed and a small Barnes' rubber bag was introduced into the stump of the trachea, distended, and gauze packed down upon it. The wound was repacked and the gauze packing was not allowed to rise in the pharynx above the level of the wound. It was soon found, however, that the simple gauze dressing was equally efficient, and tolerated better than the rubber bag, and the latter was abandoned for the former. The thyroid wings had been somewhat separated, during the operation, from the muscular structures passing upon either side of their outer walls; their divided edges were brought as near in coaptation as possible.

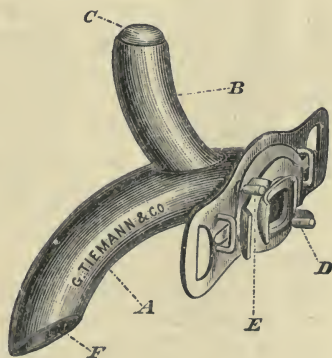
On the second day after the operation, the œsophageal tube was removed, to be again introduced, for purposes of alimentation, at the time of the dressing; but even this caused considerable pain, and finally the tube was left in position eight hours, during which time several feedings were accomplished, the tube being then removed, and the parts remaining undisturbed for four hours.

On the eighth day the tracheal tube was removed from the tracheotomy wound and inserted into the stump of the trachea. About one-eighth of an inch of the edge of each thyroid wing was now found to be somewhat discolored and showed a tendency to curl toward the median line and away from the lateral riband muscles of the laryngeal region. They were accordingly trimmed off with a pair of curved scissors. The entire cavity left by the removal of the larynx contracted with marvellous rapidity, and its walls were found to be covered by

healthy granulations. The upper end of the œsophagus had become very œdematous, and this, when the tracheal tube was removed, served the purpose of an epiglottis in preventing secretions from the pharynx, which found their way down behind the base of the tongue and into the upper portion of the wound, from entering the larynx. Up to this time the patient's diet had consisted of from four to six ounces of peptonized milk, every two hours, and two ounces of whiskey every four hours, with a teaspoonful of beef-juice. On the tenth day following the operation, the patient was allowed to attempt to swallow general fluid diet, such as egg-nog, beef tea, and cocoa.

On the seventeenth day the contraction of the muscular parts upon either side of the remains of the thyroid cartilages had brought the edges of the latter so closely in contact as to render it impossible to pack gauze in that portion of the cavity represented by the parts lying between the wings of the thyroid. The tracheotomy wound had been entirely closed for several days, and the œdema of the œsophagus disappeared. The irritation of a drop of secretion into the stump of the œsophagus caused efforts at swallowing, which act seemed to be perfectly normal. There was a painless contraction of the pharyngeal muscles, which, when it occurred, forced the secretions of the mouth through the wound and out upon the neck.

FIG. 3.



A modified Gussenbauer's artificial larynx. *A*, tracheal canula; *B*, pharyngeal or "chimney" tube; *C*, obturator, in position as in eating; *D*, button for securing ring attached by a wire to obturator; *E*, button for securely holding the chimney tube attached to the tracheal portion of the apparatus. At *F* is shown the lower extremity of the tracheal tube cut off somewhat at an angle.

On the twenty-fourth day after the operation the œsophageal tube was removed from the wound, and thereafter at each time of feeding it was passed through the mouth. The packing of the wound was discontinued and a compress of gauze placed in position over the latter, in order to absorb the secretions from the mouth, which were still discharged through the wound. On the forty-first day a modification of the artificial larynx of Gussenbauer was placed in position.

This modification consists, first, of substituting aluminium for hard rubber or silver as the material from which the apparatus is made; second, in dispensing with the cumbersome projecting ring collar—

which, besides being in the way of the patient's dress collar, is exceedingly awkward to detach and replace by the patient—and replacing it with the flat plate and retaining button of the ordinary silver tracheotomy canula (Fig. 3). With the aid of a little pocket mirror, the patient readily adjusts the different parts of the artificial larynx herself.

The patient can now make herself heard in speaking better than before the operation. On New Year's day, forty-four days after the operation, the patient partook of a hearty meal, principally solid food. On January 29th complete cicatrization having taken place, the patient was discharged cured. On May 25th the patient presented herself at my office prior to her departure for her home in the country. She is able to speak in a loud whisper, although no artificial vocal cords or reeds have as yet been supplied to the artificial larynx which she wears. At the date of writing (August, 1889), there is no evidence of a return of the disease, and the patient expresses herself as being perfectly comfortable and in good health.

Attention has already been called by Prof. Solis-Cohen to the great infrequency with which the thyroid cartilages become invaded with carcinoma or other diseases for which complete or partial laryngectomy is performed. This fact led him to consider both the desirability as well as practicability of modifying the operation in such a manner as to retain this portion of the larynx, while removing those portions already invaded, or liable to invasion, by disease. As a result of this study he advanced the opinion that, not only is it possible to lessen the dangers of the operative procedure itself, as well as the difficulties of the subsequent treatment by leaving a portion of the thyroid cartilages *in situ*, but that, theoretically at least, where the preservation of the attachments of the inferior constrictor muscles of the pharynx to these structures are considered, the functional result may be improved by the operation which he proposed.

So far as the knowledge of the writer goes, the case herewith reported is the first in which this proposition, *i. e.*, the retention of the thyroid cartilages, has been carried out. The result fully justifies the views held by Prof. Cohen concerning the operation itself and the improved functional result. The comparatively small gap left by the incision and removal of the diseased parts, and consequently lessened traumatism inflicted, the readiness with which the parts filled up by the reparative process and the firm support afforded for the artificial larynx, together with the great advantages gained by preserving comparatively unimpaired at least one of the pairs of the muscles of deglutition, will, it is believed, lead to the adoption of this method of operation, to the exclusion of all others, in cases in which laryngectomy is at all applicable.

The growth in this case, upon examination by the hospital pathologist, Dr. Eugene Hodenpyle, proved to be a typical epithelioma.

So far as I know, this is the first attempt that has been made to make an artificial larynx from aluminium. The exceeding lightness of this metal,

as compared with either of the materials heretofore employed (silver or vulcanized rubber) commends it at once to the practical surgeon. Again, the decomposition of the silver by the secretions of the parts, and the consequent formation of soluble argentum compounds, which, as has been claimed, are not without deleterious effects when absorbed into the system, are not to be lost sight of.

At *F* (Fig. 3) is shown the end of the tracheal canula cut off at somewhat of an angle; the effect of this is to increase slightly the capacity of the opening at the point at which the air enters the canula, as well as to prevent the anterior edge of this opening from impinging against the wall of the trachea.

A CASE OF EXSECTION OF THE ENTIRE ULNA, WITH RESECTION OF THE HUMERUS AND RADIUS.¹

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THE removal of bones in part, or totality, may, owing to various morbid conditions and injuries, be necessitated. The indications for these procedures when due to pathological processes, malignant or otherwise, are frequently resident in the short, flat, or mixed bones or in the epiphysial portions of the long. It is comparatively seldom that the disease pervades a long bone in its entirety, and so the complete exsection of a bone of this class together with its periosteum is rarely demanded. So rare, indeed, is this requirement, that in many of the text-books of surgery the subject receives but passing notice. The subperiosteal removal of a greater part of a long bone is not an unusual occurrence; and both Agnew and Gross mention entire exsections by a number of operators. According to these authorities, Carnochan, of New York, exsected the entire ulna in 1853. Muscroft, of Cincinnati, in 1870, and Hutchison, of Brooklyn, in 1873. Several other similar operations have been done. The one by Dr. George Williams, in which the ulna with the lower end of the humerus and the head of the radius were removed, would appear to resemble closely my operation; but as it was done for necrosis, I am inclined to think that this, as well as all of the other *entire* exsections, was to a great extent subperiosteal.

In several other of the more recent works on operative surgery (Jacobson, Stephen Smith, Wyeth, and others) complete exsections of the long bones are mentioned, but only comparatively briefly described. Wyeth shows in a woodcut the result of a subperiosteal exsection of the

¹ Read before the Medical and Chirurgical Faculty of Maryland, Session, April, 1889.

radius in which there is a very considerable deformity, but, nevertheless, a useful member.

The parts upon which exsection of the whole length of the bone, with or without its periosteum, would seem to promise most success are those in which there are companion bones; as in the forearm, or, perhaps, the leg. In such cases, especially in young individuals, and when the neighboring joints continue more or less movable, the remaining bone would probably by compensatory hypertrophy become in time, larger and stronger than normal. Even with one of the *single* long bones, viz., the clavicle, excellent results may be secured after its removal, and if the operation be subperiosteal the redevelopment of bone may render the deformity comparatively slight.

In regard to the utility of such operations and the mobility and usefulness of a member from which the whole length of one of the long bones has been removed, the subperiosteal radial exsection mentioned and illustrated by Wyeth, and the case which I here present, and upon which I operated a short while since, are examples, and, although motion be limited, the result may be an enduring benefit.

CASE.—Mrs. E. S., aged forty years; nativity English; appeared at the surgical clinic of the Woman's Medical College in November, 1887. At this time she was suffering with pain and tenderness along the left ulna, and there was a considerable degree of nodular tumefaction and redness over the lower two-thirds of the bone. The diagnosis of periostitis was not difficult, but whether it was syphilitic, sarcomatous, or tubercular was not quite so readily determined. As she had no history of syphilis, nor any manifestations whatever of this disease in other parts, it was eliminated from the list of probable causes. With regard to sarcoma and tubercle the case was not quite so clear. I was at the time inclined to suspect osteosarcoma, but subsequently came to the conclusion that the trouble was tubercular.

The previous history of the case, as related by the patient herself, is, that about eighteen months prior to that time she was taken with a severe pain in the wrist-joint, and that after two months (the pain continuing) she began to notice enlargement of the wrist, and soon nodular swellings commenced to appear and to advance up the ulnar aspect of the forearm. She was treated by several physicians, but with no greater amelioration of her condition than temporary relief from pain.

When she came under treatment at the out-door clinic, as she was pale, anæmic, and worn by much suffering, she was put upon cod-liver oil, iron, and quinia, with a camphorated ointment of iodine and belladonna for topical application. Anodynes as required. She remained under this treatment for several weeks and her general condition grew somewhat better, but there was little or no improvement of the trouble in the forearm; in fact, this continued to advance up the ulna. Seeing which, I advised amputation and obtained from her a somewhat reluctant promise to go to the hospital for that purpose. After this interview, however, she disappeared; the idea of amputation frightened her away, and I saw no more of her for about a year. In the meantime she went to another dispensary in this city and to several physicians *seriatim*.

This continued for five months; she then went to Philadelphia, and, during a sojourn there of several weeks, she consulted two surgeons, both of whom advised amputation. Returning to this city, for a number of months thereafter she had no treatment whatever, except such anodynes and domestic remedies as she took by non-professional advice. Then, impelled by increasing pain and commencing ulceration at the elbow, she returned to one of the dispensaries where she had formerly been treated.

Her trouble remaining unmitigated, she again made her appearance at the surgical clinic of the Woman's Medical College, on December 26, 1888, stating that she had come back for me to amputate her arm. At this time her general condition was not so good as when I first saw her more than a year before. The local trouble was greatly worse. In addition to increased pain and nodular inflammation along the whole course of the ulna, she had a large ulcer over the olecranon, with much surrounding tumefaction and bogginess. The flexors on the ulnar side were so contracted that the fourth and fifth fingers lay rigidly flexed and compressed against the palm. She still had limited but painful motion of the middle and index fingers.

On January 15, 1889, she entered the Hospital of the Good Samaritan. My colleague, Prof. Winslow, suggested exsection of the ulna, which advice I concluded to follow instead of amputation, as the latter could subsequently be done should the exsection fail of its purpose.

She was operated upon January 21, 1889. Under chloroform narcosis, and after application of the Esmarch bandage, an incision was made over the posterior border of the ulna from the styloid process along the whole length of the bone, passing to the outer side of the ulceration upon the olecranon, encircling this and returning by the inner side to the incision already made. After severing the lower radio-ulnar ligaments, this end of the bone was elevated and the interosseous membrane divided from below upward. The attachments of the triceps extensor and brachialis anticus muscles were then severed as well as the ligaments, capsule, and other soft parts; the joints disarticulated, and the bone removed.

Owing to the large ulcer over the olecranon, with a surrounding inflammatory area, necessitating the removal of contiguous tissues with the loss of an extensive skin surface, the lower end of the humerus was left with a deficient covering. Accordingly, the next step was to resect the end of this bone above the condyles. The incision was continued upward for two and a half inches on the posterior aspect of the humerus, and this after being denuded was sawed through obliquely. Section of the head of the radius was then made so as to fit the bones together at a right angle. They were drilled and united in this position by two stout sutures of silver.

Up to this time the operation was bloodless, but after removal of the Esmarch there was profuse and troublesome bleeding until the numerous divided vessels could be secured and ligated with catgut. Two rubber drainage-tubes, meeting in the middle and passing through the whole length of the incision, were inserted, one protruding at the wrist, the other at the elbow. The wound was closed by about two dozen sutures, five of them deep buttoned. The operation throughout was aseptic; the arm was enveloped in antiseptic dressing and supported by an anterior rectangular felt splint.

Owing to the spanæmic condition of the patient and the large loss of blood, she barely escaped collapse in the latter part of the operation. Hypodermatic injections of brandy were liberally given, she was put to bed and artificial heat applied. She reacted better than I expected, and several hours afterward was in a quite comfortable condition.

There was comparatively little pain after the operation, and the following morning she expressed herself as feeling more comfort than for many previous months. The temperature in the forenoon after the operation was 99.5° ; in the evening it had risen to 101° . On the second day the temperature did not reach 100° . On the evening of the third day the thermometer registered 100.8° . On the fourth day the temperature in the morning was normal. On the fifth day, January 25th, the drainage-tubes, from which there had been very little discharge, were removed, as also several superficial sutures, and the dressing renewed. On February 2d, all the remaining sutures were removed and the wound was healed, except where the drainage-tubes had been inserted. At the next dressing, a few days subsequently, these points were also found closed.

The patient remained in the hospital until February 21st, just four weeks after the operation. During this period her general health improved, and, at the time of her discharge, she had gained a better color and considerable flesh. Much œdema of the hand and forearm continued for a while, which was probably due to the interruption of the circulation by the extensive section and ligature of vessels which the operation necessitated. This has now nearly disappeared.

Although the resected humerus and radius were wired together, complete ankylosis did not take place, and the elbow remains movable to the extent of several degrees. She has regained considerable use of the thumb and two fingers which are left to her. She can already, without assistance, bring the hand to her mouth, hold an apple between the thumb and two fingers while she pares it, and in many other ways make the member useful and subservient to her comfort; and the value of the member seems to increase, so that with a prothetic apparatus for sustaining the parts there is a prospect of even greater usefulness.

In this case the morbid processes existed more in the periosteum and surrounding soft tissues than in the bone itself. The bone was somewhat enlarged, irregular, and roughened upon the surface. The periosteum was thickened and inflamed to such an extent that it was not considered safe to allow any of it to remain, the incision being made well away from it into the surrounding healthy tissues. The result of the operation, I think, justifies the conservatism followed, as it leaves the patient with a more efficient member than any artificial apparatus that could be devised.

REVIEWS.

DIPHThERIA : ITS NATURE AND TREATMENT. By C. E. BILLINGTON, M.D. And INTUBATION IN CROUP AND OTHER ACUTE AND CHRONIC FORMS OF STENOSIS OF THE LARYNX. By JOSEPH O'DWYER, M.D. 8vo., pp. 326. New York: Wm. Wood & Co., 1889.

THE perennial importance of the subject-matter of this book will warrant a more extended review than its merits would alone call for. It is, however, a meritorious book, and Dr. Billington is to be commended for the industry he has exhibited in the collection of facts from literature and from personal observation, upon which to base his exposition of the nature and treatment of diphtheria. While we miss the critical faculty which gives to such collations their greatest value, the results of the author's own experience are worthy of the attentive consideration due to the conclusions formed by a careful observer whose opportunities have been exceptionally large, and have included the most widely varying conditions, meteorological and epidemiological. It must nevertheless be remembered that the environment and previous history of dispensary patients, especially in the tenement districts of New York City, differ so much from the conditions encountered in private practice, that considerable reserve must be made in the application of results thus gained to the management of cases in the hands of the family physician. Drugs have a much larger value, a partly fictitious value, in those constantly exposed to the unsanitary environment of the greater number of Dr. Billington's patients.

The dose of iron, which to the well-nourished child untoughened by a constant struggle with the elements of disease, is but a slight addition to resisting powers, becomes a wonderful weapon of defence for the tenement-born and alley-bred child, that has managed to survive "two summers." So, is it too, as regards the extra-medicinal treatment; the nourishment, the alcoholic stimulation, the greater or less improvement in ventilation, or protection from deleterious exposure. With the dispensary patient, these amount almost to complete revolution in environment, and thus count for much more in the battle with disease.

Bearing in mind this important distinction, we can study the treatise before us with the expectation of deriving therefrom a useful addition to our knowledge.

The chapters are respectively devoted to "Definition and History," "Etiology," "Pathology," "Symptoms," "The Primary Nature of Diphtheria," "Secondary Diphtheria," "Diphtheritic Paralysis," "Diagnosis," "Prognosis," "Prophylaxis," and "Treatment," with an appendix on "Etiology." The distinctive characteristics are the author's views upon etiology and treatment, and we will confine our remarks chiefly to these subjects.

Diphtheria is defined as

“a specific disease which occurs sporadically, endemically, and epidemically, and is contagious and infectious, its essential characteristics being an inflammation of mucous membranes or of the surface of wounds and the adjoining integument, which tends by cellular proliferation and degeneration and by fibrinous exudation to the formation of a false membrane, and also to the production of a poison which, when absorbed into the circulation, causes morbid changes in the blood and in various organs of the body.”

For the production of the disease a specific poison and favoring conditions must coöperate. Age, previous disease producing inflammation, erosion or ulceration of the mucous membrane of the outer air-passages, special family and individual predisposition, cold and dampness—the latter, however, chiefly through their tendency to excite catarrhal inflammations which may afford a suitable nidus for the specific poison—are among the principal favoring conditions. While it is admitted that diphtheria may occur independently of those conditions of filth, bad drainage, overcrowding, absence of ventilation, etc., to which much of its prevalence in the tenement districts of New York is attributed, yet the close connection between such unsanitary surroundings and outbreaks of this disease, is more than a coincidence. They constitute the most potent factors in its endemic prevalence, and the marked decrease in its mortality since 1875 is, at least in part, due to the removal of some of these evils through the efforts of the board of health.

Insanitary conditions may favor the occurrence of diphtheria by producing diseases which predispose to the reception of the special poison, by the endemic perpetuation and reproduction of that poison, or possibly by its generation *de novo*.

While admitting the possibility or even the strong probability of “mixed infection,” the author seems most inclined to accept the results of Roux and Yersin; namely, that the bacillus of Klebs and Loeffler is the causative agent, and that it acts by means of a chemical poison which it produces, this poison being of the nature of an enzyme rather than that of an alkaloid.

After full discussion of the evidence, Dr. Billington summarizes his own conclusions somewhat as follows: Diphtheria is caused by a parasite whose growth and multiplication outside of the body are favored by dampness and insanitary conditions, and which is reproduced in the disease. Its presence on mucous membranes is sometimes innocuous. Its vital activity is greatly increased under the conditions which prevail during an epidemic. Its pathogenetic action is greatly favored by pre-existing morbid conditions of the body, and especially those involving lesions of the epithelium. This parasite being implanted upon a mucous membrane or a wounded surface, produces a chemical poison, which in turn gives rise to the local diphtheritic process by direct action on tissues and vessels; and this ptomaine being reproduced and more and more widely diffused, is absorbed, and thus causes constitutional manifestations. This morbid process is often followed by invasion of other pathogenetic bacteria, to which various complications are due. No bacterium thus far discovered in connection with diphtheria can furnish a reliable diagnostic criterion.

The important point in this theory is that it looks upon the disease as of strictly local origin; a ptomaine produced by a specific bacterium which has obtained lodgement usually upon an inflamed or abraded sur-

face, causing first by chemical action the local diphtheria; the systemic toxæmia following.

In further support of the view of primarily local origin, to which a chapter is devoted, the author adduces the clinical history, alleging that a frequent source of error is the confounding of the symptomatic fever and nervous disturbances common to the onset of many inflammatory affections, with the evidences of constitutional infection or blood-poisoning which occur later in the disease and are of a different character; namely, pallor, depression, somnolence, etc. Only to this latter group of symptoms, he argues, may we apply the term "constitutional diphtheria," understanding thereby a systemic disease due to the absorption into the blood of morbid products of the diphtheritic process. The earlier group of symptoms is devoid of specific character. Another source of error is the absence of complaint of pain or local soreness, in some cases exhibiting constitutional symptoms, and in which pseudo-membranous exudation exists but is not looked for. "The more strictly the physician observes the rule to examine the throat of every sick child, the fewer will be the cases in which he will suppose the constitutional symptoms to have preceded the local ones."

That there is much to be said in support of this position none can deny. The discussion is old, and it is still unsettled. While we believe that constitutional poisoning precedes even the so-called "catarrhal stage"—in other words, that there is a distinct period of incubation, however short, and that the disease is diphtheria and nothing else from the very start—we admit that septic infection from the products of local morbid action adds to the gravity of the situation, and we are, therefore, at one with the author and with all teachers of extended experience with this disease in the important therapeutic point that thorough and continuous disinfection of the nose and throat is essential to the proper management of every case.

The question of the identity of croup and diphtheria, or, in other words, the exclusive agency of the diphtheritic poison in exciting all forms of non-traumatic pseudo-membranous laryngitis or tracheitis, is discussed at some length. It is admitted that the discrimination attempted to be based upon differences in the histological characteristics of croupous and diphtheritic inflammation and their resultant products, cannot be sustained; as local anatomical peculiarities, and differences in the degree of inflammation, will account for all the distinctions that have been pointed out. On the other hand, however, we have identical processes and products resulting from various mechanical and chemical irritants, and the testimony of competent and reliable observers to the occurrence clinically, of pseudo-membranous laryngitis in no way traceable to diphtheritic infection, and not giving rise to cases of diphtheria. Further, such cases show a much more close relation with meteorological conditions than do undoubted cases of diphtheria. Another argument for the occurrence of non-diphtheritic croup, is the admitted though rare existence of idiopathic fibrinous bronchitis. On the whole, the author concludes that simple membranous croup does occur, though it is a comparatively rare form of disease; but he suggests that in regions where diphtheria is endemic or epidemic, the liability to intercomplication is so great as to render the distinction practically useless.

With this dictum we cannot agree. Precision in diagnosis is never useless. If we are dealing with a membranous croup of idiopathic origin,

upon which diphtheria has supervened, it is well to know even that, for it may influence both prognosis and treatment; while a certainty that we are not dealing with diphtheria but with a morbid process having but a superficial resemblance to it in one respect, will undoubtedly much influence treatment. Remembering that the term "croup" simply indicates that a false membrane is present in the air tube; that this product is the peculiar response of mucous membranes to irritation; that it may be caused by various agents, and thus cannot be in itself specific or pathognomonic; and that, therefore, causation as well as clinical phenomena must be investigated; the discrimination should always be attempted and can usually be made. Of clinical discriminative phenomena, broadly speaking, the most significant are those which in simple croup show that we are dealing with a sthenic inflammation, dangerous chiefly in that its product may mechanically cause death by suffocation; and on the other hand, those symptoms of toxæmia in the croup of diphtheria, which show us to be dealing with a septic process that adds to the danger of suffocation, that of death by paralysis or exhaustion of vital mechanisms.

Symptomatology is discussed at length, in accordance with the type and localization. The author distinguishes a "catarrhal stage," differing in no respect from the initial stage of other forms of sore-throat; a stage of pseudo-membranous formation, and a terminal stage. Gangrene is rare, but it does occur in a small proportion of cases in which the inflammation is intense and the infiltration deep. Its occurrence appears to bear no relation to the gravity of the case in other respects, and some cases in which there has been considerable gangrenous destruction of tissue recover. The term malignant diphtheria should not be indiscriminately applied to all cases in which constitutional poisoning is marked, but should be reserved, as in scarlatina, "for that class of cases which are characterized by exceptional earliness and intensity in the systemic poisoning and by such rapidity in the course of the disease that the distinctive features of its several stages are confused together and unrecognizable." There are two forms of this malignant diphtheria—the violent, "which differs from a form of severe diphtheria . . . only as the tornado differs from the ordinary storm;" and the insidious, which has but a moderate degree of febrile disturbance, and in which the false membrane is of limited extent; though marked pallor, depression, and somnolence indicate from the first, overwhelming poisoning, and death occurs from the third to the seventh day.

In the discussion of diagnosis, the occurrence of herpetic, septic, and other forms of non-diphtheritic membranous sore-throat as described by Da Costa, J. Solis-Cohen, Mackenzie and others, is distinctly recognized; and the discrimination from lacunal tonsillitis is set forth at length. Infectious catarrhal tonsillitis (spreading quinsy) is likewise recognized as a distinct affection. The diagnostic points upon which the author chiefly relies, are two: First, the localization of the membraniform patches in lacunal tonsillitis, that is, in relation to the orifices of the crypts, and therefore chiefly on the more central portion of the convexity of the gland; while true diphtheritic membrane when limited to the tonsil, usually occupies a more lateral or marginal position: Second, in lacunal tonsillitis, syringing the throat with warm salt water will wash away much deceptive matter, showing the friable and superficial character of the membraniform covering, and disclosing its relation to the distended orifices of the lacunæ.

While cases will occasionally be encountered in which a positive diagnosis must be reserved, yet the number in which these methods, combined with accurate observation, will fail, is in the author's experience surprisingly small. He relates a case in which laryngeal stenosis accompanied with exudation upon the tonsils necessitated tracheotomy, yet his opinion that the disease was not diphtheritic was confirmed by the fact that another case in the same house progressed and ended as lacunal tonsillitis. The reviewer has reported a somewhat similar pair of instances, though the larynx did not become involved in the graver of the cases referred to.

Treatment begins with prophylaxis. When there is one case in a family the well children should be sent away if possible; their throats should be inspected twice daily, and tincture of iron, with or without potassium chlorate, may be administered with advantage.

The indications in treatment are, "to destroy, remove, or limit the action of the invading poison; to subdue or limit the inflammation; to obviate occlusion of the air-passages by false membrane; to promote the elimination and counteract the effects of poison which may have been absorbed; to economize and sustain the vital forces in their combat with disease; to avert and combat the morbid effects of the disease upon particular organs and other special dangers which may arise in any case during its course." Successful treatment not only demands a careful adaptation of measures to each particular case, but patient persistency in the use of well selected ones. Impatience, indecision, and changes without definite reason, are elements of defeat.

Methods of administering remedies are briefly considered. Of local measures, gargling is not available with young children, and with older patients is often fatiguing, unpleasant, and inefficient. Spraying requires coöperation of the patient and is not available with children under three years. Irrigation is therefore to be preferred in most instances. It may be effected with a syringe of piston, fountain, or hand-ball variety. The first is usually preferable. It must be employed with the utmost gentleness consistent with efficiency. Its special applicability is to the nasal passages, and to the throat in cases of children too young to be sprayed. Dr. Billington prefers the half-ounce rubber ear-syringe, with the nozzle padded, or a special instrument with soft-rubber nozzle. The reviewer has been best satisfied with the use of a glass urethral syringe, to the nozzle of which is attached a section of soft-rubber tubing projecting an inch or two beyond the glass tip. This little point of detail is quite important. It facilitates manipulation, and effectually prevents pain or injury. The method of vaporization and inhalation has advantages in some cases; particularly where constitutional as well as local effect of the medicament is desired. Its chief limitation, according to Dr. Billington, is interference with respirability of air; but properly managed, this should not be frequent. Direct topical application by brush, pencil, or cotton wad has the advantage of precision and accurate limitation, and is, therefore, specially adapted for irritating and concentrated substances.

The various agents and methods, topical and constitutional, employed and recommended by divers authorities, are then passed in detailed review. We can refer only to the most important.

Admitting the advantages of caustics in some cases, if used sufficiently early, the counter-indications and dangers are considered so numerous

that they are not to be recommended for general use. Of astringents, Monsel's solution and the tincture of the chloride of iron, either pure or diluted with glycerine, are the most useful. Of solvents of false membrane, lime-water is, for many reasons, highly regarded by the author; though trypsin is a more active solvent, and pepsin is preferred to trypsin. Steam is not deemed advisable in the pharyngeal form of the disease. The reviewer has not observed any particular advantage from the use of solvents, with the exception of hydrogen peroxide; which, indeed, he believes to be the best of all agents for use by irrigation, particularly in nasal diphtheria. It is an efficient antiseptic if used in sufficient strength (about ten volumes) and stimulates tissue-repair and return to normal production of healthy epithelium. Dr. Billington, however, from a limited use of the same agent, of which he speaks under the head of antiseptics, thinks it inferior to many others. Of the various antiseptics, preference is given to the corrosive chloride of mercury, both for local and internal administration. The author, however, considers that if certain limits are passed, mercurials may become dangerous irritant and depressant poisons, and even cause an unfavorable termination. We are inclined to look more favorably than the author upon the early use of calomel. It should be given in sufficient doses and frequency to produce characteristic stools, when it may be substituted by the corrosive chloride in small doses. Gastric or intestinal irritation is a signal for withdrawal of the drug.

Carbolic acid, for local use in proper dilution, is highly spoken of.

While recognizing the dangers of excessive dosage of potassium chlorate, the author uses it freely, locally and internally, usually in a four per cent. solution; and some patients have taken this in teaspoonful doses hourly or half hourly for several weeks continuously. In twenty years' experience, he has not had reason to ascribe to it any injurious effects, and nephritis and albuminuria have been rather infrequent than otherwise. We cannot help considering this an exceptional experience, and would not commend the practice for general imitation. We believe potassium chlorate internally to be one of the least useful of all drugs vaunted in diphtheria; and with Jacobi, think its local use principally beneficial in preventing concurrent stomatitis, which might invite extension of the pseudo-membrane. The use of borax, locally and internally, is referred to. We are acquainted with practitioners in this city who rely upon it almost exclusively and who claim to have very good results. Oil of turpentine is a useful inhalation and may be given internally, according to Baruch, in doses as high as half an ounce in children six to fourteen years of age, once a day or oftener if demanded. The reviewer was taught to keep the air of the sick room impregnated with turpentine by constant evaporation from the surface of warm water in shallow pans, and has had cause to attribute to this measure a favorable influence upon the course of the disease. Delthil's results from inhalation of turpentine and tar vapors, especially in averting the need for tracheotomy, or favoring its successful issue, will be remembered.

Eucalyptus may be used by keeping the patient in an improvised tent and placing the dried leaves in a vessel of boiling water beside the bed. We have been well satisfied with an expedient recommended by Wittauer for pertussis; namely, to keep a sponge saturated with eucalyptol in a bag of cheese cloth which is suspended from a string tied about the neck

of the patient. It has seemed to be particularly useful in averting bronchial complications. Chloride of iron internally is "undoubtedly the most efficient known antidote to the poisonous action of the putrefaction-products of diphtheria in the system at large." It must be given in sufficient doses. In those cases in which a marked tendency to septic poisoning is manifested, the use of the drug should be pushed toward the limit of tolerance; and from one to three ounces daily may succeed where less amounts would fail. Alcohol is useful in assisting to maintain nutrition and averting the tendency to adynamia and heart-failure. The symptom to be especially regarded is the pulse. The quantity given should be large, and may often be heroic. The author advises, however, that it should be reserved for use in those crises in which it is definitely indicated; while in the majority of cases which are early and well treated these indications will not be presented, and its use will therefore be disadvantageous. While agreeing with Dr. Billington that it is not a specific, and should not be used indiscriminately, we think it should be given in moderate dosage from the first in all undoubted cases of diphtheria, unless very mild in type, and pushed unhesitatingly to the point of tolerance as soon as the slightest tendency to adynamia is manifested. In this connection allusion may be made to the advice of Jacobi, not to wait for symptoms of heart-failure, but to prevent that complication by timely use of strychnine, digitalis, or musk.

Following this discussion the author proceeds to recapitulate in connected form the plan of treatment he prefers, and through which he was enabled to report to the New York Academy of Medicine, in 1876, and subsequently, from the dispensary practice of himself and his assistants, some two hundred and fifty-six carefully recorded cases, with a mortality of less than ten per cent. With questions of novelty, originality, or priority, we have no concern. The author lays great stress upon adherence to certain minutiae, and, in especial, upon certain formulæ for internal medications and local applications. He thus claims to accomplish: "(1) The most efficient possible local disinfection; (2) without irritation; (3) by frequent applications; (4) which are so pleasant as not to arouse the opposition of children nor unnecessarily to annoy or fatigue older patients."

These are unquestionably important elements in successful treatment; and although we do not share the author's belief in the superior efficacy of his particular formulæ, we heartily endorse the opinion that it is necessary to have some definite plan and to follow it persistently.

While there are many agents having the same general properties from which choice may be made; and while we would prefer holding ourself at liberty to make such choice as particular conditions might indicate, it may be admitted that the author's routine choice has shown itself to be good by the results following his practice. Briefly his recommendations are as follows: Having taken the necessary precautions as to isolation, ventilation, etc., if the attack shows a tendency to severity or is attended with marked febrile symptoms, he gives calomel in a single purgative dose of two to ten grains, or preferably in divided doses of one-fourth grain to a grain every half hour, hour, or two hours. Ice, ice-water, water ice, and frequent cool sponging allay fever. If early enough, and age and accessibility render it feasible, abortive treatment is attempted by cleansing the affected spot or spots and then touching with a solution of corrosive sublimate, 1 to 1000 or 1 to 500; a mild antiseptic or solvent spray being used in the intervals. If the affection increases, this pro-

cedure is to be abandoned. As a constant spray, to be used as frequently as possible, importance is attached to the formula of a solution of ten minims of carbolic acid in four ounces of lime-water. If an antipyretic is needed, sodium salicylate is given in doses of from two to fifteen grains in water, hourly or every two hours. If this is not tolerated, antipyrin or antifebrin may be given if urgently called for. He does not use quinine in the early stage. In the majority of cases, he administers from the outset chlorate of potassium and chloride of iron, alternately or in combination. Glycerine and lime-water are the menstrua, and again stress is laid on special formulæ. We thoroughly agree with the high opinion of iron, but would avoid potassium chlorate. Bichloride of mercury may be given in connection with this treatment, and the earlier its use is begun the more likely is it to have good effects—a view we can heartily endorse. Formulæ for combination are given, so that the dose is from $\frac{1}{150}$ grain to $\frac{1}{50}$ grain hourly, in not less than a dessertspoonful of milk or water. Diet should consist of liquids or semisolids, and persistence in the administration of sufficient quantities at intervals of about two hours, is necessary. Where possible, we would employ from the start highly concentrated and predigested foods, both carbonaceous and nitrogenous. The time for spraying, feeding, and giving medicine should be so arranged as to give as long a continuous interval of rest as possible; and we would even prefer lengthening the intervals between medications and applications, except in the very worst cases, so as to give more rest than Dr. Billington's plan permits.

In nasal diphtheria, the cleansing and disinfection of the nasal passages are all-important. Warm salt water (one drachm to the pint) is the solution employed. Some add corrosive sublimate one grain, borax one or two drachms, or salicylic acid four grains. Sodium hyposulphite, boric acid, thymol, and many other agents might have been added to the list, and, as already stated, we prefer to all others hydrogen peroxide. To avoid exhausting the child by useless struggles it is advised that three persons coöperate; one holding the child across her lap, the other steadying its head against her breast, and the third, preferably the physician, making the injection with gentleness, but with sufficient force to remove all pseudo-membrane and secretions. If thoroughly performed, repetition from two to four times in the twenty-four hours will suffice. The indications for alcohol have been referred to; and quinine is employed under the same conditions, in severe cases or in later stages. Among other tonics at this time, digitalis and strong coffee are recommended; and for kidney complications, if threatening, the free use of calomel and dry cupping. The frequent administration of comparatively large doses of iron to combat septicæmic depression is again properly urged.

Medical treatment in reference to laryngeal diphtheria is (1) preventive and (2) mitigating or curative.

Preventive measures are those which tend to check the spread of the primary affection and those which have a special tendency to prevent laryngeal complication, as the inhalation of unirritating antiseptic and astringent sprays or vapors—especially carbolic acid and lime-water—and the internal use of mercurials or terebinthins.

Among curative measures, the author's favorite spray of lime-water and carbolic acid is again given high rank; and solvents, such as pepsin and trypsin, are recommended. A much-misunderstood point in the effective administration of sprays—namely, that the particles of fluid

must mingle with the inspired air in order to reach the larynx, and that, therefore, the atomizing tube should be at some little distance from the mouth—is clearly stated. The inhalation of steam is recognized as of great value, and the proper method, by means of a tent constructed about the bed or crib, with an opening for ventilation, is described. While the fact is clearly stated that the boiling of lime-water as so frequently practised is useless, sufficient stress is not laid upon the proper method of giving inhalations of steam impregnated with lime; namely, the constant slacking of large pieces of lime in hot water contained in a large vessel, such as a wash-tub or a clothes-kettle. Bichloride of mercury is of special value in this form of diphtheria; and in special conditions non-depressant emetics may be useful, at least as palliatives.

The great mortality of laryngeal diphtheria, when treated solely by medicinal measures, estimated by Mackenzie at ninety per cent., prepares for the discussion of operative measures. Dr. Billington speaks only of tracheotomy, leaving intubation to be discussed by Dr. O'Dwyer. According to the most recent statistics, tracheotomy shows an average success of twenty-eight per cent. In special groups of cases, and with individual operators, a much better showing is made; the best cited by the author being Caselli's record of ninety-five lives saved out of one hundred and fifty cases. The indications, the conditions influencing the result, and the technique of the operation are considered with sufficient detail. We agree with the author that it is better to operate too early than to lose the chance of success by operating too late; though probably the safest course to-day, in a doubtful case, will be to intubate first and if intubation fails to give sufficient relief, then to perform tracheotomy. The author lays great weight upon the suggestion of W. Cheyne for prophylactic tracheotomy, in order to apply disinfectant treatment through the tracheal opening to the mucous membrane of the larynx and trachea with the view of checking extension downward. A different method of accomplishing the same result is Roser's admirable plan of surrounding the tracheal canula with a tampon of antiseptic gauze or muslin, sufficient to close the trachea completely.

Contrary to the author's opinion we prefer the low operation, which, though more difficult, is further removed from the seat of disease; and, as is particularly insisted upon by J. Solis-Cohen, the use of an anæsthetic is to be deprecated, as adding an unnecessary danger in an already desperate case. If the child is properly wrapped in a towel or blanket, a skilful operator should experience no difficulty without anæsthesia that he would not also encounter with it. The author does not insist with sufficient clearness upon the absolute necessity of a thorough search for, and removal of, all detachable false membrane before insertion of the tube; the opening being meanwhile kept patent by forceps, retractor, or special dilator. The advantage of the use of a hollow pilot to facilitate introduction of the tube, as practised by J. Solis-Cohen and the late Krishaber, is a point which, in common with the majority of operators, the author fails to appreciate. While the importance of the after-treatment is in a general way alluded to, and no doubt fully understood by the author, he does not devote sufficient space to it, or give the explicit directions that are necessary. Difficult as is tracheotomy in children, yet competent operators are much more readily found than are surgeons familiar with the minutæ of the after-treatment in croup and diphtheria. Not alone what to do, but what not to do, should be explicitly stated.

In fact, without a skilled medical attendant to watch the case for at least twenty-four to forty-eight hours, and to prevent intermeddling of officious nurses, the chances for recovery of a tracheotomized patient are very slim. The care of the wound, the care of the canula, the maintenance of a proper atmosphere, the administration of nutriment—by enema, if necessary—the management of the steam or lime inhalations which are still required, and the modifications of medicinal treatment which circumstances may call for, are fully as important as the skilful opening of the windpipe.

Dr. O'Dwyer's article upon intubation is a valuable and timely contribution to medical literature. It is lucid and concise; and without unnecessary verbiage yet gives a full and detailed account of the operation—its philosophy, its indications, its technique, its complications and its incidents, with instructions how to gain its advantages and avoid its disadvantages. Many points of detail are given from the author's rich experience, and from that of others, and we would strongly advise all who intend to resort to this procedure to study carefully the article. As to the position of the operation, that is now assured. The latest statistics from croup and diphtheria show about twenty-eight per cent. of recoveries, the same as for tracheotomy, while individual records are in some cases much better. We are not of those who believe that it can ever fully supersede tracheotomy. As a routine operation it will save more lives, because it will be permitted so much more readily, but we know that there are and always will be cases saved by tracheotomy which intubation could not save. Choice between the two may have to be decided with reference as much to the patient's environment as to his condition. The surgeon should be thoroughly familiar with both operations, and be prepared to do whichever offers the better prospect, all things being considered, in the individual case. The previous performance of intubation will not, except perhaps in the matter of possible delay, render a subsequent tracheotomy any the less successful; and we believe it is, and usually will be performed much earlier than the cutting operation. This is not Dr. O'Dwyer's advice however. He considers the indications for intubation to be the same as for tracheotomy. "There is no reason," he says, "why one should be performed earlier than the other. The beginning of the third or suffocative stage is the time to interfere." And so speak other operators of large experience; and claim that their reports are of cases that formerly were considered to warrant tracheotomy. While there can be no doubt, then, that the experience of intubation represents, on the whole, as distressing cases as does the experience of tracheotomy; we believe, from our own observation with both procedures, and from all that we can learn upon the subject, that the recovered cases include a far less percentage of the more desperate ones. The comparative richness of intubation statistics in the few years that it has been practised, and with the bulk of the practice in the hands of less than a dozen men, is sufficient evidence of this fact. The experience of Wharton, at the Children's Hospital in this city, certainly places a higher value upon tracheotomy as a life-saving operation in the cases of greatest stenosis; and Gay, of the Boston City Hospital, who has had a large experience with both operations, would seem to be of the same opinion in his recent remarks at the Pædiatric Section of the American Medical Association.

This does not detract from Dr. O'Dwyer's great merits in having

patiently and persistently overcome obstacle after obstacle until he had brought to perfection the procedure that will make his name live forever; nor from the very great value of the operation in rendering tracheotomy unnecessary in a large number of cases.

One of the greatest difficulties attending intubation had been the feeding of patients, but this has now been largely overcome by the plan of Casselberry of Chicago, of placing the patient in the inclined position, head downward, and having him drink through a tube. Rectal feeding may also be employed. Opiates, chloral, bromides, or sulfonal, should be employed if necessary to induce sleep; and the practice of hourly or half-hourly medication should not be continued. The child should be permitted to rest as much as possible during the day, and during the night should have at least three hours' uninterrupted sleep.

Intubation in the adult can be best accomplished with the aid of the mirror. It has been successfully practised in all forms of acute and chronic stenosis. While it is deserving of a persistent trial in cases of chronic stricture, in the few cases that have come under our observation it has not been of permanent benefit; resort to the older methods of cutting, progressive divulsion, or gradual dilatation having been necessary after removal of the tube. Further experience is needed to formulate the indications.

S. S. C.

LECTURES ON NERVOUS DISEASES. By AMBROSE L. RANNEY, A.M., M.D., Professor of the Anatomy and Physiology of the Nervous System in New York Post-Graduate Medical School and Hospital, etc. Pp. 751. Philadelphia: F. A. Davis, 1888.

THE increase in the literature and importance of nervous diseases has made this an inviting field in which to venture, even if neither knowledge, experience, nor reputation seemed to warrant it; and after looking over the results of Dr. Ranney's short but decided excursion into the realms of the brain and spine, it seems but natural to regret that he has made such an elaborate use of his very limited knowledge of nervous diseases. It is impossible to write a critical review of this book of Dr. Ranney's, it will only be necessary to discuss the subject of "eye-defect" and "eye-strain;" look at the illustrations and the binding, and an unpleasant duty is done.

In his preface, Dr. Ranney calls attention to the fact that the section which treats of "functional" nervous diseases is the most important in the book, and trusts it will "receive the careful attention it deserves." This is the key-note of the book. The subject of "eye-defect" and "eye-strain," developed by Stevens some years ago, is the pivot around which all his investigations turn.

Referring to this method he boldly says in his preface, "no other treatment has ever yielded me such satisfactory results in severe forms of epilepsy, hysteria, chorea, neuralgia, headache, insanity, and functional visceral derangements." To treat these varied and complex diseases by a single method of any kind would seem to be nonsense, but to assert boldly that the correction of errors of refraction, or what is called "graduated tendency of the eye-muscles," will cure this formidable list of

brain, spinal cord, and abdominal diseases, is little less than insanity itself.

Dr. Ranney's claims are too large, and include too many widely different diseases, to demand the serious attention of the profession. He is advising the neurologist to give up the investigation of the nervous system, and to confine himself to the nerve and muscles which have hitherto been the special study of the oculist. Indeed, if the practice he so highly recommends is to be carried out, these two important branches of special practice must be blended into one. The views of Dr. Stevens, which Dr. Ranney so enthusiastically advocates, have not been accepted by the profession, and have been widely criticised and doubted.

In order to show the extent to which Dr. Ranney has pinned his faith to this theory of "eye-strain" and "eye-defect," with the accompanying shadow of "graduated tenotomy," we will quote from page 481, where, under the heading of "Prognosis of Epilepsy," he relates the following remarkable cases:

"One case of insanity recovered his full mental faculties in a few weeks after I performed a tenotomy of his internal recti muscles, and he has shown no tendency to relapses. An epileptic, in whom all convulsive attacks ceased after I performed the same operation upon her, was very deficient in intellect before that step, and is now rather above the average in mental powers. One of the most remarkable cases that ever came under my observation was that of a combination of chorea, epilepsy, and idiocy in a girl about eleven years of age, who completely recovered her health, strength, and mental faculties when a refractive error in the eyes was corrected by glasses, and a serious combination of muscular defects in the orbit was adjusted by tenotomy. This case was one that I saw some three years ago in connection with the practice of Dr. Stevens. At the first examination, the child could not walk without being supported on both sides, drooled constantly, talked unintelligibly, answered questions with apparently little conception of their import, could hardly sit unsupported in a chair on account of chorea, had epileptic seizures repeatedly during the day and night, and presented a most pitiable and apparently hopeless aspect.

"I saw her again, about a year after the operations were performed, at the request of Dr. Stevens. I found her free from chorea and epilepsy, able to run and skip a rope unaided, rosy-cheeked, and in full possession of her mental faculties. Photographs of this case have been already published by Dr. Stevens."

This is but a fair sample of the claims made for the supremacy of the morbid eye over the nervous system, and the controlling effect of what is called "graduated tenotomy" over what were formerly considered the most intractable of nervous diseases. The fact that these theories are so tenaciously held will have a bad effect upon the book as a reliable work on nervous diseases, and it cannot be denied that any one accepting these peculiar views would have a very erroneous idea of the subject.

In every part of the work the same prevailing idea is found. In the section "Electricity in disorders of the sensory nerve tract," page 727, under the heading of "visceral neuralgias," the following remarkable digression will be seen:

"The removal of the exciting cause will, however, greatly assist in making the cure a radical one. I have long taught in my lectures that I had yet to encounter a patient who had suffered for years from migraine who had not some defect in the eyes or its muscles as an exciting cause. Experience leads me still to strongly assert this as my conviction. The same cause is very fre-

quently manifested by paroxysms of spinal pain, peculiarly so at two points, viz., between the scapula and at the junction of the last lumbar vertebræ with the sacrum."

Over one hundred and twenty pages are devoted to the special consideration of electricity in medicine, but one is inevitably brought back to the same point, as the above quotation very conclusively shows.

The illustrations are numerous and old, and in some cases repeated, as on page 163, we find an illustration, colored, from Charcot, of paralysis agitans, to show the gait and attitude of the patient as a factor in diagnosis; and again, the same illustration is used, not colored, on page 589, under the heading of the diagnosis of paralysis agitans.

If an author has an hobby, let him ventilate in the journals, or in a work specially devoted to it, and not undertake an ambitious treatise on nervous diseases, in which from the preface almost to the last pages the burden of the volume is the "eye-strain" and "graduated tenotomy." Frankly, in this case the burden is too heavy, and must seriously affect the work in the estimation of those who are capable of looking at the subject from a conservative and scientific standpoint. J. V. B.

EPITOME OF SURGERY: BEING A COMPLETE COMPENDIUM OF THE SCIENCE AND ART OF SURGERY. By RIDLEY DALE, M.D., M.R.C.S.E.; Member of the Northumberland and Durham Medical Society. 8vo., pp. xii., 498. London: H. K. Lewis, 1889.

THE surgeon who, at the present day, undertakes to supply either student or practitioner with a "complete" compendium of the science and art of surgery is almost unavoidably open to unkind comments from a censorious or hypercritical reviewer. The mass of material to be handled is so vast, and the necessary omissions so numerous, that nothing can be easier than to point out deficiencies. Still, when, in addition to the above sub-title, we read that it was the author's intention to produce a synopsis of the most important points in surgery to serve the student as an aid in preparing for examination, and learn that Dr. Dale has had twelve years' experience in dealing with candidates for surgical diplomas, we not unnaturally expect to find his work brought well up to the present time; especially as he also expresses the hope that it will be of service to the practising surgeon.

In turning over its pages, even while making allowance for the need of condensation, one is struck with the failure to mention many modern methods of treatment, and operations now of almost daily performance. A few illustrations may be taken at random: In treating of the radical cure of hernia, after describing the antiquated and useless methods of Heaton, Wutzer, and Spanton, he devotes more than two pages to Wood's subcutaneous operation, almost equally obsolete, and concludes the article without mentioning the procedures of Macewen, or Barker, or Banks, or any of the others now so frequently employed. The article upon stricture of the urethra contains no allusion to the effects of strictures of large calibre; no mention is made of the relation between the circum-

ference of the flaccid penis and the urethral calibre; no allusion to Otis's dilating urethrotomy; it abounds with such loose statements as "internal urethrotomy is division of the stricture through the urethra," "it is suitable in cases of stricture at the bulb of a gristly nature," etc. In the article on exstrophy of the bladder no mention is made of Roux's operation or of Maury's excellent modification of it. In the article on injury and disease of the spine there is no reference to the use of extension in cases of spinal paralysis, none as to the possible diagnosis and removal of tumors, none to Treves's operation for the removal of carious portions of the lumbar vertebræ. In the description of antiseptic dressings the old method described by Lister and Cheyne is given with all its details, but no mention is made of the fact that surgeons generally, including Sir Joseph Lister himself, have abandoned the spray, that many of them have omitted the macintosh, and that various other important modifications have been made. The possibility of treating wounds without drainage is not alluded to. Arthrectomy and erosion are not even mentioned. In the article on the treatment of syphilis no allusion is made to the fact that many practitioners employ a continuous instead of an intermittent course of mercurials; and in describing the treatment no mention is made of the green iodide of mercury, which is preferred by so many practitioners in all countries. Similar omissions may be found on nearly every page, and in this country, at least, would render the work valueless to the candidate for a diploma. It is noticeable that the methods and teachings of Mr. Berkeley Hill, to whom the book is dedicated, are followed throughout to the exclusion of many other authorities of even greater eminence. The book abounds in quotations, some of them judiciously selected, but many of them out of date and useless. On the whole, it is scarcely to be recommended in its present shape, either to the student or to the practitioner of surgery. J. W. W.

ELECTRICITY IN THE DISEASES OF WOMEN, WITH SPECIAL REFERENCE TO THE APPLICATION OF STRONG CURRENTS. By G. BETTON MASSEY, M.D., Physician to the Nervous Department of Howard Hospital, etc. 12mo., pp. viii., 210. Philadelphia and London: F. A. Davis, 1889.

THE subject of this book is one which, at the present time, is receiving the closest attention at the hands of many intelligent and thoughtful men. It is not a simple subject, for the use of a powerful agent under conditions which may be fraught with serious consequences to the one upon whom it is used, demands more than the superficial knowledge which some writers think sufficient. This book is conservative in its tone, its author is frank and candid, not asserting that electricity can be used for all pelvic disease, and yet expressing a conviction that its field is not a narrow one. The methods of Apostoli are, in the main, endorsed and followed, while it is believed that some of them are susceptible of improvement. The element of personal experience in the book is large, but suitably expressed. The portion which is devoted to the narration of cases is susceptible of condensation, though we admit that a subject of this character allows of rather more than the usual detail, if histories

are to be introduced into the text at all. It covers a wider range of subjects in which pelvic disease is to be treated by electricity than any similar work in English with which we are familiar, and is, on the whole, a very creditable production.

A. F. C.

THE DISEASES OF THE CHEST. INCLUDING THE PRINCIPAL AFFECTIONS OF THE PLEURÆ, LUNGS, PERICARDIUM, HEART, AND AORTA. By VINCENT D. HARRIS, M.D. Lond., F.R.C.P., Physician to the Victoria Park Hospital for Diseases of the Chest, etc. 16mo., pp. xi., 419. Philadelphia: P. Blakiston, Son & Co., 1889.

THE author has fully succeeded in the attempt to set forth concisely and clearly "the chief known facts about the diseases of the thoracic viscera." He has produced a book which may safely be put into the hand of the student, without danger of misleading that sorely tried reader into the easy but fatal path of "cram." "Lead us not into temptation" might well be the student's daily prayer to the makers and publishers of the rapidly proliferating "guides" and "compendes," which may perhaps give him sufficient pretense of superficial information to enable him to pass the trial of memory miscalled a professional examination, but which leave him helpless and hopeless in the presence of disease. Dr. Harris's book, on the contrary, is a thoughtful and systematic condensation of an important subject, written by one who is evidently thoroughly informed; and it is, therefore, a veritable "Students' Guide." It cannot be mastered by memorizing; it refers throughout to first principles; it is accurate; and within its purposed limits, thorough. Used as the note-book might be, in connection with the more elaborate text-books, and hand-in-hand with actual examination of normal chests and of patients, it will be found highly useful. The discussion of the anatomy and physiology of the chest and its contained viscera, and the exposition of the significance of the various symptoms other than physical signs, which precede the systematic treatment of the etiology, pathology, symptomatology, diagnosis, and treatment of thoracic diseases, are well conceived and clearly written. The views of the author are in general those prevailing at the present day; hence detailed discussion would be out of place in this notice.

S. S. C.

LECTURES ON THE ERRORS OF REFRACTION AND THEIR CORRECTION WITH GLASSES. DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL: WITH ILLUSTRATIVE CASES FROM PRACTICE, BOTH PRIVATE AND CLINICAL. By FRANCIS VALK, M.D., Lecturer on Diseases of the Eye, New York Post-Graduate Medical School, etc. 8vo., pp. xii., 241, with 89 illustrations. New York: G. P. Putnam's Sons, 1889.

BESIDES such matter as its title implies, this book contains chapters on the "Anatomy of the Eye and Orbit," "Ophthalmoscopy," and "Muscular

Asthenopia." Many of the illustrations are quite new, and, though roughly drawn, well perform their function; they truly illustrate the text and the subject. The teachings of the work are generally sound and clear. In its perusal, however, one is reminded that a verbatim report of a good lecture makes poor reading, or the repetition of the text of a well-written book a very poor lecture. In teaching by lecture, more of repetition, of varied statement of the same fact, is not only allowable, but necessary. When the words are to be heard but once, the idea must be divided and subdivided into parts, each of which can be clearly set forth in a brief, simple sentence. Where the sentence can be reread, should its meaning not come out clearly on first reading, it is proper to employ a more condensed style, and so effect a saving of the reader's time and effort. Dr. Valk has resorted to a compromise between the lecture style and the book style, but it can hardly be claimed that he has completely overcome the difficulties of the situation. E. J.

RECTAL AND ANAL SURGERY; WITH DESCRIPTION OF THE SECRET METHODS OF THE ITINERANT SPECIALIST. By EDMUND ANDREWS, M.D., LL.D., Professor of Clinical Surgery, Chicago Medical College, and EDWARD WYLLYS ANDREWS, M.D., Professor of Clinical Surgery, Chicago Medical College. Second edition, revised and enlarged. 8vo., pp. xiv., 140. Chicago: W. T. Keener, 1889.

THIS is the second edition of a book the teachings of which are well known, and are, on the whole, sound and reliable. The portion of the book devoted to a description of the secret methods of the itinerant quacks who call themselves "rectal specialists," and who are lineal descendants of the original "pile doctors," is still interesting and applicable to existing conditions, as is also the chapter added in this edition upon the diseases of the "sacculi Horneri" and columns of Morgagni, which have served these charlatans so well for so many years. The large cities of the East, including Philadelphia, could furnish examples of the shameful impostures practised by these persons as striking as any mentioned by the authors. The writers reject on theoretical grounds Whitehead's operation for hemorrhoids, and, for sounder statistical reasons, the operation by injection, retaining a preference for Allingham's operation by ligation, for which excellent detailed directions are given.

A new chapter on the anatomy of the rectum, and another on proctitis, together with a formulary of prescriptions for use in hemorrhoids, proctitis, fissure, rectal ulcers, pruritis ani, etc., add to the value of the work. J. W. W.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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MILK SUGAR AS A DIURETIC.

PROFESSOR SÉE has recently presented the result of his study of the diuretic action of milk sugar, which he considers the most reliable of all diuretics. In diseases of the heart and stomach, and also in renal or cardiac affections accompanied by dropsy, its diuretic qualities render it very serviceable. Milk in these cases, as is well known, is of great value, not only on account of its diuretic properties, but also because it is so complete a food. Three or four quarts of milk a day may be used with advantage, but the proportion of sugar in milk is rather too small. Professor Sée has discovered, by experimenting successively with the different constituents of milk, that lactose is the active agent. The action of the other constituents of the milk, such as the water and the salts, is inconsiderable, the chloride of sodium adds nothing, and the salts of potassium very little, to the polyuria induced by the sugar of milk.

This sugar is found in all kinds of milk, is crystalline, and quite soluble in water. About three ounces of it dissolved in two quarts of water, with complete suppression of every other liquid, as soup, tea, wine, mineral water, etc., will afford marked diuresis in all cardiac troubles, no matter what the lesion may be, though the results are less constant in arterio-sclerosis.

In twenty-five cases abundant diuresis resulted; at least eighty ounces of urine were passed, usually one hundred or more, in the twenty-four or forty-eight hours subsequent to beginning the treatment. As soon as the treatment was stopped the amount of urine fell off to what it had been before the administration of the diuretic. Professor Sée, therefore, considers lactose to be, not only the most efficient diuretic, but also the least harmful. If milk is used, and two quarts only are taken, diuresis follows; if four quarts of milk, containing six and one-half ounces of sugar of milk, marked glycosuria is pro-

duced; at the same time there is considerable excretion of urea, indicating a destruction of the albuminates. With the sugar alone these disadvantages may be avoided, for three and a quarter ounces of milk sugar in water will set up a copious diuresis, such as we cannot be sure of having from even four or five quarts of milk.

The polyuria resulting from this treatment surpasses that from all other methods; the amount of urine rises rapidly to two, two and one-half, usually to three or three and one-half quarts, and even to four or four and one-half quarts on the third day. After this it remains at that point, or drops to two and one-half quarts for some days. After a few days the same treatment may be employed to repeat the diuresis.

It is fair to say that this action of lactose may be relied upon in cases of cardiac dropsy, but in those of renal origin its effects are slight. In cardiac disease it never fails unless the kidneys are diseased, and the amount of albumin is considerable. When the amount of albumin is small, the result is favorable, from which it may perhaps be inferred that there is present only a simple venous congestion.

It is suggested that the diuresis may serve as an indication of the condition of the kidneys. Various conditions may affect the diuresis; sometimes diarrhoea occurs, and this diminishes the amount of urine, or the patient may have been subject to profuse sweating, which would also lessen the quantity of urine.

As a rule, the remedy is well borne. It may be prescribed for eight or ten days and then omitted for a few days and again renewed. If the simple solution is not well tolerated, brandy or peppermint may be added to it. All other liquids should be reduced in amount or omitted while this treatment is pursued.

This method presents great advantages over many others, and the patient may partake of any food; a meat diet, if the physician so desire. Professor Sée considers that the physiological action of lactose is upon the kidneys, since it does not exert any influence upon the circulation. He classes it with caffeine, as he believes that caffeine acts upon the kidneys only, and not through the circulation, as do digitalis and strophanthus.

Lactose is regarded as superior to caffeine, as it does not affect the brain and nervous system.—*L'Union Médicale*, June 15, 1889.

CHLORAMIDE AS AN HYPNOTIC.

At first sight it seems as if we were already provided with a sufficient number of hypnotics, but more careful study reveals the fact that some of them act very slowly, others, though more prompt in their action, have accompaniments which form contraindications. For any special case we are apt to find that the choice is not as large as imagined.

Among many recent hypnotics this one is brought forward with less than the usual flourish of trumpets which heralds the birth of a new drug. From the account given of its use in Professor Strümpell's clinic, in the *Münchener medicinische Wochenschrift*, No. 31, 1889, it may prove to have some qualities not possessed by the other members of this class. Chloramide is an addition-product from chloraldehyde and formamide.

It is a white crystalline body, of somewhat bitter taste; it is decomposed in alkaline solutions, and is, therefore, best given in a slightly acid one. It may be given in wine, as it is readily soluble in alcoholic solutions. It dissolves in nine parts of water. The dose is thirty to forty-five grains, and in Germany this would cost about three cents.

It seems to be best adapted to cases where there is not much pain; in cardiac affections, in neurasthenia, in diseases of the cord, and in phthisis it has proved serviceable. Out of twenty-eight cases it was efficacious in all but two or three. Compared with chloral, it is reported as being the stronger hypnotic; its taste is better and the accompanying symptoms are less. In one case collapse was observed, but it was not certain that it had been brought on by the drug. A slight pain and fulness of the head after waking seem to be the only after-effects.

Thirty grains is a sufficient dose, especially for women; in severe cases, forty-five grains is a suitable amount, given in capsules or in wine.

No unpleasant action on the circulation, respiration, temperature, digestion, or on the secretion of the urine was observed. The experience thus far with chloramide warrants further trial, though, like many other remedies, the disadvantages of its use will be more apparent with a larger experience.

DR. REICHMANN (*Deutsche medicinische Wochenschrift*, No. 31, 1889) began the use of chloramide by giving doses of fifteen grains, and obtained very varying results; with doses of thirty grains the action was better, and with forty-five grains still more satisfactory.

When the drug was administered in the daytime and was not followed by sleep the patients complained of headache. In severe cases the patients felt tired and sleepy after waking in the morning. It does not seem to have a depressing action on the circulation. In short, this observer considers chloramide a very serviceable hypnotic with few drawbacks.

DR. ERICH PEIPER has also found chloramide a useful hypnotic. Sleep is induced by it in from a half to one and a half hours, in doses of from thirty to forty-five grains. In many patients it causes headache, dizziness or lassitude on the day following its use. For insomnia, with diseases of the cord, asthma, subacute rheumatism, and diseases of the stomach, where there is no intense pain, it has been found serviceable and is to be preferred to chloralhydrate.—*Deutsche medicinische Wochenschrift*, No. 32, 1889.

SULPHONAL.

DR. S. GARNIER has published in the *Annales méd. Psychologiques* a careful study of the use of sulphonal in mental diseases. He considers it the most certain in its action of all the recent hypnotics; in almost all cases the insomnia may be relieved by doses of from thirty to seventy-five grains. It seems to be more reliable than either paraldehyde, urethan, or chloral, and it has the advantage over these drugs of being tasteless. In one hundred cases, vomiting was caused in 5½ per cent., and a slight diarrhœa was observed in 17 per cent.; these symptoms contraindicate the use of the remedy, and when they are accompanied by dizziness and a staggering gait, it should be omitted if congestive symptoms are present.

In cases where the sulphonal was administered only on every other day the patients were relatively quiet during the interval.—*Deutsche medicinische Wochenschrift*, No. 25, 1889.

ADMINISTRATION OF CHLORAL IN ECLAMPSIA.

The condition in which the patient is found often precludes the administration of chloral by the ordinary channel. If the woman is in a state of profound coma, she cannot be made to swallow; if the drug is injected in solution into the rectum, it may not be retained long enough to permit absorption to take place. For subcutaneous administration, the drug is too irritating and the dose too large. Other methods have been suggested, among them to pour the solution, through a tube in the nasal passage, into the pharynx; this is very apt to excite coughing, and the solution is promptly rejected.

Dr. Emile Blanc has introduced the chloral by means of a moderate-sized stomach-tube passed through the mouth or nose into the stomach, and recommends this method above others.—*Lyon Médicale*, June 30, 1889.

THE INFLUENCE OF HYPNOTICS ON THE PROCESS OF DIGESTION.

PROF. CRAMER has made a study of the process of digestion as influenced by some of the hypnotics now commonly employed. Chloral, paraldehyde, hydrate of amylene, and sulphonal, were tested with regard to their influence on the saliva, the gastric juice, and pancreatic secretion. Cramer employed the method of artificial digestion. He found that the diastatic action of mixed saliva is not interfered with by the drugs referred to. The capacity to digest fibrin is not reduced by weak solutions of chloral, paraldehyde, amylene hydrate and sulphonal. In a proportion of one to twenty, all of these, except sulphonal, retard this action. The functions of the pancreatic juice were markedly influenced by chloral and paraldehyde, less so by hydrate of amylene, and not at all by sulphonal.

These drugs should not be indiscriminately dispensed, especially in cases where the digestion is already impaired.—*Medical Record*, August 10, 1889.

RECENT EXPERIMENTS ON THE ACTION OF IODOFORM.

Whether iodoform is a valuable antiseptic or not is a question about which much has been written and many experiments made. On one hand there seems to be a very large clinical experience which leads us to infer that it probably has remarkable antiseptic properties. On the other hand, when tested in the laboratory as a germicide, it has been found to be far behind some other agents. To reconcile these conflicting views is not easy, with the knowledge at our command at present.

That iodoform is unable to render certain bacteria harmless by exposure to it outside of the body, is unquestionably true. Possibly it is capable of thwarting the fatal consequences of certain bacteria when it is applied to the site of inoculation before or soon after the otherwise fatal organisms have been introduced. It is conceivable that the iodoform may act in some way upon the ptomaines which are formed, and thus be serviceable in the wound, though powerless as a germicide.

While iodoform is valueless as against certain microorganisms, its presence is capable of rendering the development of others impossible, though all other conditions are favorable for their growth.

As an agent in the treatment of cold abscesses, iodoform seems to have a

special value. Of fifty-four cases of cold abscess, forty were successfully treated by puncture and subsequent injection of an emulsion of iodoform. Further, the growth of cultures of the bacillus of tuberculosis is inhibited in the presence of iodoform or of its vapor.

DR. TILANNS'S review of the recent investigations on the action of iodoform leads to the conclusion that for the antiseptic treatment of wounds we possess better agents among the soluble antiseptics. Against tuberculous infection, on the other hand, the systematic use of iodoform is more promising than that of any other agent.—*Münchener medicinische Wochenschrift*, Nos. 32 and 33, 1889.

TOXIC ACTION OF COCAINE.

PROF. WÖLFLE points out that the cases in which unpleasant results have followed the injection of cocaine, are chiefly those in which the drug has been employed about the head. It seems that it is more dangerous when injected in proximity to the brain. While one may use $\mathfrak{M}\text{xvj}$ of a five per cent. solution in all other parts of the body, for injections about the head the same amount of a two per cent. solution is sufficient.—*Schmidt's Jahrbücher*, No. 7, 1889.

CASTOR OIL AS A MENSTRUUM FOR COCAINE.

To lessen the irritation caused by a cicatrix rubbing over a corneal ulcer, DR. S. MITCHELL employed a solution of cocaine in castor oil; this relieved the pain and permitted the ulcer to heal after other solutions had been tried in vain.—*Medical Record*, August 3, 1889.

ACTION OF ASTRINGENTS.

Any series of experiments which will throw light upon the action of such astringents as are most frequently employed, must prove suggestive and useful to the practitioner.

DR. R. HEINZ has set himself the task of studying the local effects of several useful astringents, in varying degrees of concentration, upon the frog's mesentery.

Dilute solutions of tannin, $\frac{1}{100}$ per cent., cause narrowing of the blood-vessels, which is more marked with stronger solutions; but $\frac{1}{2}$ per cent. to 1 per cent. solutions cause dilatation, after a brief initial contraction; the same holds for still stronger solutions.

Alum, in solutions containing $\frac{1}{80}$ per cent. to $\frac{1}{2}$ per cent., also causes contraction; in a strength of 1 per cent. or over, dilatation of the blood-vessels.

Acetate of lead solutions containing $\frac{1}{100}$ per cent. to 1 per cent., cause a narrowing of the vessels even stronger than that from tannin or alum; more than 1 per cent. causes dilatation.

Sulphate of zinc solutions, $\frac{1}{100}$ per cent. to $\frac{1}{2}$ per cent., cause a prompt narrowing, and 1 per cent. or larger amounts cause contraction.

Sulphate of copper has a similar action.

Sesquichloride of iron, $\frac{1}{20}$ per cent. to 1 per cent., causes a rapid narrow-

ing; 1 per cent. to $2\frac{1}{2}$ per cent. finally induces dilatation. With $2\frac{1}{2}$ per cent. solutions, coagulation takes place in the capillaries.

Nitrate of silver, in solutions containing $\frac{1}{100}$ per cent. to 1 per cent., causes a contraction of the vessels.

Corrosive sublimate in solutions of 0.005 per cent. causes narrowing; 1 per cent. solutions, dilatation, after a previous contraction.

This action of the astringents is a local one.

Their action as styptics is due to their property of precipitating albumin, and thus causing coagulation of the blood. This takes place only by direct contact between the styptic and the blood. The firmest coagula are made by nitrate of silver, sesquichloride of iron, and tannin.

Capillary bleeding may be stopped by a 10 per cent. tannin solution or a 2 per cent. solution of sesquichloride of iron; hemorrhage from small veins by means of a concentrated solution of tannin or an 8 to 10 per cent. solution of the iron salt.

The action of astringents in inflammation is also of interest, since strong solutions stimulate inflammation and weak solutions inhibit it. If an artificial inflammation—that is, one induced by mechanical means—is treated by dilute astringent solutions, the migration of the leucocytes is checked.—*Fort-schritte der Medicin*, No. 15, 1889; *Schmidt's Jahrbücher*, No. 7, 1889.

CREOLIN.

PROFESSOR FORSTER, of Amsterdam, recommends creolin as a disinfecting agent for various domestic purposes, such as the disinfection of floors, furniture, vessels, or clothing.

Solutions containing one-half or one per cent. of creolin are excellent germicides, and stronger solutions may be employed for purposes of disinfection.

The composition of this substance is not yet well understood, but is now the subject of investigation.—*Münchener medicinische Wochenschrift*, No. 26, 1889.

POISONING BY CREOLIN.

Though creolin is among the safest of the antiseptics, the following case, which will be quoted only briefly, indicates that we are not justified in regarding the use of this antiseptic as wholly free from danger:

A strong, healthy man, thirty years old, took, in the evening, eight ounces of creolin with suicidal intent. He soon became unconscious, and was carried in that state to the hospital. The patient vomited, and the stomach was also washed out. Next morning the patient was conscious, and during the day vomiting was frequent. There was much thirst, but no pain. On the tongue and in the mouth there were no indications of caustic action. The urine had a specific gravity of 1022 and contained a trace of albumin; its color was greenish-black—like carbolic urine. By physical examination the organs were all normal.

On the second day the vomiting ceased, the liver and spleen were enlarged, the urine had a specific gravity of 1037, and contained a quantity of albumin and blood. It gave the reactions for creosol.

On the third and fourth days there was some jaundice, the skin and conjunctiva being slightly colored. The urine on these days was small in amount and of high specific gravity, 1030 and 1038. The patient complained of cramp-like twitchings in the upper extremities, which appeared to be brief clonic contractions.

After this time the condition of the patient improved, the amount of urine increased, its specific gravity was less, and the albumin soon disappeared.

After about two weeks, the patient drew attention to the posterior surface of both forearms, where there was found an area not sensitive to pain, and only slightly to touch. This improved slowly.

In recent years there have been reported two other cases of creolin poisoning, one of them doubtful. Evidently the nervous system and the kidneys are especially liable to the action of this substance, and it is important to submit the urine to a careful examination.—*Berliner klinische Wochenschrift*, August 12, 1889.

THERAPEUTIC ACTION OF SENNA PODS.

DR. A. W. MCFARLANE directs attention to senna pods, an old remedy, for the relief of constipation. He finds that they have many of the advantages of senna leaves, without some of their inconveniences.

The taste and odor of an infusion of senna leaves are nauseous, its administration is so commonly attended by griping, tenesmus, and flatulence, that it is seldom prescribed except in conjunction with a carminative. The disagreeable symptoms are more marked if the leaves are infused for a long time.

An infusion of the pods, on the other hand, is almost free from taste and smell; certainly it is devoid of the characteristic odor and flavor of senna. It is slower in its action than an infusion of the leaves, but equally certain. An ordinary dose produces without fail one motion, seldom more, of soft consistence, in from eight to ten hours. It is, in short, a reliable evacuant, free from irritating properties, such as cause griping and flatulence.

After a fairly extended experience in its use it has not been disappointing in its utility in any one case; nor has it produced untoward effects.

The dose for an adult is from six to twelve pods; for the young and very aged, from three to six. They are best infused in a claret-glassful of cold water for six or eight hours. A liquid extract has also been prepared.—*Lancet*, July 27, 1889.

EFFECTS OF PROLONGED CHLOROFORM ANÆSTHESIA.

Some observations made about two years ago by Dr. Ungar pointed to fatty degeneration of the heart and liver as the cause of death after repeated prolonged administration of chloroform. Further experiments on dogs have recently been made by DR. STRASSMAN, which appear to confirm this view. Dr. Strassman found that the first organ to be affected was the liver, then the heart, and after that other viscera. The nature of the morbid change was not a fatty degeneration, but fatty infiltration. The actual cause of death in fatal cases appeared to be the cardiac affection, as in all such a very marked degree of change was found in the heart. In non-fatal cases the morbid

change was found to have disappeared in a few weeks' time. When morphine was given previously to the chloroform, less of the latter was required, and consequently the changes produced were not so considerable as when the ordinary amount was given. Animals suffering from hunger, loss of blood, etc., were especially predisposed to the morbid changes due to chloroform.—*Lancet*, July 20, 1889.

SODIUM ETHYLATE.

DR. ARTHUR JAMISON has used the caustic with success in the removal of superfluous hair from the face, in the removal of nævi, and of small vascular areas, seen on the sides of the nose in children, formed by vessels radiating from a common centre.

In the case of a small child, where a large portion of the forehead was covered with superfluous hair, the patient was put under the influence of chloroform, the long hair cut short, and the sodium ethylate rubbed over a portion of the hairy surface with a glass rod. The application was made freely and thoroughly, till the skin had an orange appearance. By the time the child had slept off the effects of the chloroform, the pain of the application had ceased, so that the child was fairly comfortable. A little cold cream was then applied.

At the end of a fortnight the result of this first attempt was seen. The hair follicles over the greater part of where the application had been made seemed destroyed, and a whitish skin remained. Here and there some long hairs remained uninjured. The subsequent progress of the case was slow. It consisted in touching from time to time the hair follicles that had not been destroyed by the previous applications.

This method is recommended in the treatment of hairy moles above any other method of treatment. That by electrolysis is often painful, always tedious, and only applicable for limited hypertrichosis, such as that on the lips or chin. In the case of moles, where we want not only to remove hairs, but also the discoloration of the skin as well, the use of the ethylate has given Jamison better results than the application of any other agent.—*Practitioner*, July and August, 1889.

MEDICINE.

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THE THERAPY OF CERTAIN CASES OF PERNICIOUS ANÆMIA.

H. MEYER (*Correspondenzbl. f. Schweiz. Aerzte*, June 1, 1889) reports a case of a woman who, toward the end of her second pregnancy, began to suffer

from nearly persistent pain in the gastric region, fatigue, headache, palpitation of the heart, and a sense of oppression after the slightest exertion. She lost also her appetite, and sometimes vomited and suffered from diarrhœa. Almost every evening she experienced chilliness, alternating with a sensation of heat. Her strength diminished, and a very marked anæmia developed. After delivery the patient did not improve. Evidence of gastro-intestinal derangement continued; dizziness, weakness, and dimness of vision developed, and the anæmia increased and became extreme, though there was no marked emaciation. There was nowhere tenderness on pressure, except in the gastric region. Blowing, systolic murmurs could be heard over the heart and in the vessels of the neck.

Under the conviction that the anæmia was due to disturbances of digestion, the author prescribed Bland's pills and a nourishing, easily digestible diet. No improvement followed, and the weakness became soon so great that the patient was unable to sit up, and remained the entire day, half sleeping and apathetic, in the same position. There was always some elevation of temperature, with a rapid pulse.

The diagnosis of pernicious anæmia was now made, and seemed to be confirmed by the discovery of retinal hemorrhages in both eyes. The author tried various plans of treatment in vain, and the patient seemed about to die, when he bethought him of a similar case reported by Sandoz in which lavage of the stomach was followed by prompt recovery. He therefore performed the operation, allowing the water to flow until it came back clear. The patient, greatly exhausted, immediately fell asleep, to awake after some hours greatly refreshed and without dizziness, noise in the ears, or headache. The temperature had also fallen to normal. He intended to repeat the operation, but by the next day the condition was so greatly better that it was not necessary. In a few days recovery was complete.

The author emphasizes the fact that the symptoms were exactly those of pernicious anæmia, and claims that a doubt can scarcely be entertained as to the correctness of the diagnosis. The cause was, without doubt, a disturbance of the functions of the stomach. It is scarcely possible that there was present any gastric disorder with important anatomical lesions, since there were no characteristic symptoms of any such, and recovery was too rapid to be accounted for in this way. It is more likely that there were produced on the surface of the gastric mucous membrane abnormal products of fermentation which penetrated into the organism, and, interfering greatly with the nutrition of the tissues, produced the pernicious symptoms. As to the exact nature of these products he makes some suppositions, but leaves the question undecided. The results obtained justify a further trial of this method in similar cases.

INVESTIGATIONS ON THE DURATION OF LIFE OF THE TYPHOID BACILLI IN TYPHOID DEJECTIONS.

KARLINSKI (*Centralbl. f. Bakteriöl.*, B. vi., No. 3) has arrived at conclusions which differ somewhat from those of Uffelmann, published in this JOURNAL some time ago. He endeavored to determine the following points: 1. In what period of the disease can the bacilli be detected in the dejections?

2. Can the discovery of these in the feces be considered a diagnostic sign of the disease? 3. How long are the bacilli of the typhoid stool capable of living? 4. How long can they live in the contents of drains?

His investigations were made on twenty-one well-marked cases. In not one of the twenty-one cases was he able to detect the microbes in the feces before the ninth day after the initial chill. They first appear, namely, at the time when the necrosis of the Peyer's patches begins. At first they are very few in number, but increase continually, and in cases where intestinal hemorrhage shows the high degree of severity which the ulceration has reached they become numerous. From the moment in which the temperature begins to fall, and the stools begin to be more solid, the number of the bacilli rapidly diminishes. In all of the twenty-one cases they had disappeared by the twenty-fourth day, and in some much sooner than this. In only one instance were they still present as late as the fiftieth day, and this fact was clearly due to the occurrence of a relapse. The discovery of the bacilli has some diagnostic value, especially in the case of children and in atypical cases. The author has found in this way that a peculiar endemic febrile disorder occurring extensively in Herzegovina, and which has been described by Pick as an independent disease, is only a very atypical form of typhoid fever.

Further investigations have shown: 1. That the typhoid bacilli will not continue to live in the typhoid stool more than three months. 2. That the keeping of them in different temperatures has no noteworthy effect on the duration of their existence. 3. That the presence in the stools of those rod bacteria which have the power of liquefying gelatine is very injurious to the typhoid bacilli, and causes their entire destruction after ten to sixteen days. The author found that in the absence of these bacteria the typhoid bacilli were capable of great increase in number in the typhoid stool. By the end of two months, however, the number had become small.

Several very interesting experiments are detailed, made in the endeavor to determine the action of the bacilli under the most natural conditions, as in drains and the like. Among the results obtained the author discovered that the foul liquid from privy-wells, sewers, and drains was always of a weakly-acid reaction, and was very fatal to the typhoid bacilli, killing them within forty-eight hours; but he did not determine the relative part borne in this destruction by other microorganisms present, the products of decomposition, and the chemical composition of the foul fluid. He endeavored also to discover how long the typhoid bacilli would live in the solid and alkaline feces taken from a drain, as well as the influence of river water, rain water, urine, garden soil, river mud, and sun on them. The general conclusions upon which he ventures are the two: that the greater quantity of foul sewer-liquid, water, and of putrefactive microbes present, the more rapid is the destruction of the typhoid bacilli which have passed with the dejections into the sewer; and, secondly, that the duration of the life of the typhoid bacilli when mingled with the contents of the sewer is decidedly shorter than Uffelmann's investigations would seem to show.

ŒDEMA OF THE BRAIN.

HUGUENIN (quoted in *Wien. med. Presse*, No. 28, 1889) distinguishes two varieties of œdema of the brain—the inflammatory and the non-inflammatory.

Inflammatory œdema, or diffuse encephalitis, is observed in perforating wounds of the skull with any kind of injuries to, or crushing of, the brain substance; in brain-tumor, as soon as a central necrotic softening takes place in it and approaches the periphery; in abscess; in infectious diseases; and less often in hemorrhages and hemorrhagic infarct.

As regards uninflammatory œdema, opinions have been at variance whether the peculiar arrangement of the circulation within the skull would permit of the exudation of sufficient serous fluid to produce a rapid and fatal pressure on the brain. As the result of his anatomical studies, the author takes the view that disturbances of the circulation in intracranial diseases can produce no fatal œdema as long as the vessels and the conditions within the skull are normal; but that these disturbances, for whose adjustment there are fully satisfactory arrangements under normal conditions, can produce fatal œdema, if previously existing changes are present in the skull or brain. These changes are, obliteration of the ports of exit for the lymph, moderate chronic pressure on the brain through contraction in the size of the skull, or, much more, through arrest of its development, diseases of the brain which produce a greater or lesser degree of pressure. Theoretical considerations would explain the so-called congestive œdema of the brain, *i. e.*, the effusion of serum under the membranes, into the brain and into the ventricles, as being due to a hyperæmia of relaxation, as it is termed, of the vessels of the brain, so that more blood streams through them. At first this occurs with greater rapidity on account of the diminished resistance in smaller arteries; so that instead of the vessels bearing thirty per cent. and the surrounding parts seventy per cent. of the pressure, as in the normal condition, the vessel walls do not bear more than ten per cent., and the surrounding parts receive about ninety per cent. The pressure exerts itself against all distensible parts, such as the fontanelles and the vertebral ligaments, which yield as far as they are able. At the same time there is an increased efflux of the cerebro-spinal liquid through its normal channels, and this may serve to relieve the pressure. If, however, the tension of the bloodvessel walls diminishes, and the pressure of the cerebro-spinal liquid exceeds ninety per cent., this efflux is of no avail. The pressure becomes so great that compression of the capillaries takes place and, thereby, a general obstruction to the circulation, with consequent stagnation of blood in the dilated arteries, and fall of pressure in the veins. The fluid constituents of the blood then leave the vessels, collect in the sub-pial space, brain and ventricles, and the œdema of the brain is established.

This supposition explains the congestive œdema which is said to be common in children, and only rarely to occur in adults. Not in accord with this is the fact that children, unlike adults, have *two* arrangements for compensation—the fontanelles and the ligaments; and still less do those experiments accord, which show that even a very considerable increase of pressure, artificially produced, does not provoke œdema of the brain.

As a result of his studies on his own cases, the author comes to the following conclusions:

1. Those children which were supposed to have died of hyperæmia of the brain, œdema, or slight hydrocephalus, were always found to have had a beginning meningitis, usually of an infectious nature, *i. e.*, a streptococcus-meningitis. What, therefore, the author would formerly have regarded as a

congestive œdema, he would now designate as streptococcus meningitis, more or less developed.

2. On the other hand, fatal œdema of the brain, of a congestive nature, does occur in children, but only under particular circumstances. The first of these is chronic meningitis, which produces obliteration of the channels of exit from the sub-pial space, and obliteration of the Paccionian granulations. In adults, also, chronic meningitis may play a similar rôle. The second factor in the production of fatal congestive œdema is present when a pressure on the brain is already in existence, which is, perhaps, already nearly as great as can be endured by the organ. If now any irritation produce a hyperæmia of relaxation, its action will be very rapid, since the brain possesses scarcely any further power to yield to pressure. To this class belong: 1. Fatal cases of œdema of the brain due to lack of power of the organ to expand; this being the result of a too early ossification of the sutures. 2. Fatal cases of œdema of the brain occurring after the intra-cranial space had already been diminished by some disease of the brain. Here belong three categories of affections: acute hemorrhage, tumor and abscess in the inner parts of the brain, which have not yet produced a meningitis; finally, a traumatism of the brain not communicating with the atmosphere.

PSEUDO-LOCOMOTOR ATAXIA FOLLOWING DIPHThERIA.

MORTON PRINCE (*Boston Med. and Surg. Journal*, June 20, 1889) describes two cases of ataxia following diphtheria. In the first there was complete absence of the knee-jerks, slight ataxia of the hands, and moderate ataxia of the legs. The patient swayed abnormally when the eyes were shut. The hands and legs were slightly paretic, with slight anæsthesia of the fingers and feet. There was no change in the eye-ground, and the pupils were normal. There was no atrophy or muscular irritability; no paralysis of the soft palate, bladder, or bowels; no tenderness of muscles or nerves, nor lightning pains. The faradic reaction of the muscles was good. The patient—a physician—had cut his finger two months before while making an autopsy on a diphtheritic patient. The accident was followed by swelling and inflammation of the finger and arm, but no membrane formed in the wound, and no marked constitutional symptoms developed. About ten to fourteen days later he had difficulty in swallowing liquids, which regurgitated through his nose, and two weeks later still the weakness of the hands began. While under the author's care the legs began to improve, but the patient persisted in continuing at his work, and the hands grew worse. Finally he consented to take absolute rest in bed, and at once began to get better, and in the course of somewhat over a month was practically well.

The second case was that of a child of four and a half years, who had had diphtheria followed by a nasal character of the voice. After about eight weeks there suddenly developed paralysis of the soft palate, absence of knee-jerks, and great ataxia of the legs. There was some paresis, but no anæsthesia, and some awkwardness in the use of the left arm; while the head tended to fall forward and could not well be turned to the right; the pupils reacted sluggishly and unequally, and exhibited some rhythmical oscillation in strong daylight. By the eleventh week the boy grew much worse, and

paralysis obscured the ataxia. He then passed from under the author's observation.

LATENCY OF ATAXIC SYMPTOMS IN CASES OF OPTIC ATROPHY.

G. I. WALTON (*Boston Med. and Surg. Journal*, August 1, 1889) calls attention to the early occurrence of optic atrophy in locomotor ataxia, and says that in persons in whom there exists this atrophy without recognizable cause, the chances are altogether in favor of the symptoms of tabes developing later. He quotes the statement of Gowers, that optic atrophy so universally appears early in the disease, that, after the ataxic gait is fairly established, it is of rare occurrence. Also the converse statement that, when optic atrophy has become developed, it is common for the other symptoms of locomotor ataxia to remain in abeyance. In a large number of cases the ataxia never comes on, the spinal malady becoming stationary when the nerve suffers.

If this be true, its bearing both on prognosis and diagnosis is of considerable importance. Walton has, therefore, studied the matter from this point of view, and has looked through the records of sixty-six cases of locomotor ataxia in the hope of throwing additional light on the subject. In fourteen of these optic atrophy was present, and in six others there was decided loss of vision, but no description of the optic nerve was given in the notes. The noticeable features among these cases were the large proportion in which the knee-jerk was retained on one or both sides, and the large proportion in which ataxia was either absent or slight. To this absence or indefinite postponement of the ataxia he calls especial attention as confirming the statements of Gowers. As the loss of the knee-jerk usually occurs so early in locomotor ataxia, it was significant that in a number of the cases showing optic atrophy, the knee-jerk was preserved. The constancy of one symptom—the Argyle-Robertson pupil—was noticeable in the cases with optic atrophy, as in those without it. This symptom, together with characteristic pains, may, it seems, be looked for early in these cases, however latent the motor symptoms.

The practical bearing of these facts is to assist us in both diagnosis and prognosis. As regards diagnosis, they lead us to consider with confidence as instances of locomotor ataxia certain cases of optic atrophy which we would otherwise hesitate to place in this category, on account of the presence of knee-jerk and the absence of ataxia. As regards prognosis, they would lead us to predict a comparative latency of the motor symptom of the disease where optic atrophy has become pronounced. The author closes his paper with a detailed account of several cases illustrative of the points which he has made.

SUSPENSION IN THE TREATMENT OF LOCOMOTOR ATAXIA.

EDWARD WAITZFELDER (*Medical Record*, June 8, 1889) reports his experience in the treatment of several cases of locomotor ataxia by the method of suspension. The early part of the treatment was carried out by suspending the patients three times a day for three minutes at a time; later the suspensions were only made once every other day, each lasting from one-half to three minutes. The results in all the cases (six) were excellent. In all of

them there had been for years no change at all, or a gradual increase in the severity of the symptoms. All plans of treatment had been followed and abandoned. While under the new method practically no medicine was used. Every one of the patients said he was better than before the treatment, and the author is confident that this was not due to psychic influence. He is convinced that the suspension produced a direct impression on the spinal cord, but does not understand in what way this takes place. It would seem likely that the traction exerted on the spinal nerves in some way brings about a change in the circulation and nutrition of the spinal cord; and that the amelioration of the symptoms is due to the lessening of the vascular supply of the cord and its membranes.

PNEUMONIA TREATED WITH PEROXIDE OF HYDROGEN.

J. L. GREENE (*Medical Record*, July 20, 1889) concluded after some study of the action of peroxide of hydrogen, that it might be well employed in the treatment of the "high line," or congestive, and the croupous, or acute lobar pneumonias which are common and very often fatal in the Rocky Mountain region. He has accordingly treated twenty-three cases in this way, and with only one death; this occurring in a puny infant, too far gone when first seen to be saved by any treatment. The main treatment consisted in the internal administration of peroxide of hydrogen; little use being made of antipyretics or opiates. The dose sometimes recommended is far too small, as in the high line form the patient would exhaust the effect of the first dose, and die from apnoea before the second would be due. The author has often given one-fourth to one-half of a teaspoonful, well diluted with water, once in five to ten minutes for an hour or more, with benefit, even when no condition of emergency existed; and he has continued this until after the crisis occurred. Under this treatment he has found the crisis a time of comparatively small importance, and that a case taken early in the stage of engorgement can usually be aborted, and the infiltration removed from the lung.

PHTHISIS TREATED BY INHALATIONS OF HOT AIR.

G. C. SEARS (*Boston Medical and Surgical Journal*, 1889, cxxi. 33) reports the results of his careful trial in four cases of phthisis of the treatment by inhalations of hot air proposed by Weigert. He employed a simple and efficient apparatus which he describes. The sittings lasted at first half an hour, morning and evening, and were gradually increased to an hour. The temperature of the inspired air was at first 160° C., but was soon raised to 200°, and even 220° (428° F.). Salivation and soreness of the mouth occurred in one case, as well as double vision lasting a short time after each sitting during the first few days. The author thinks the following summary justifiable, as far as conclusions can be drawn from so few cases:

1. Cases so treated differed but little in their course from those treated by the older methods. Whatever gain was noticed seemed more justly attributed to the expansion of the lungs from forced inspirations than to the effect of the hot air *per se*.
2. Little influence can be expected from it upon the development of the bacilli. Any germicidal action it may have is largely exerted in sterilizing

the bronchial secretion, and it is to be looked upon rather as a prophylactic measure against the spread of the disease than as curative in any particular case.

3. While it is not proven that the occurrence of hemorrhage in these cases was at all dependent upon the form of treatment, theoretical considerations make it probable that it increases the tendency thereto and suggest caution in its use.

NIGHT-SWEATS.

ROSENBACH recommends the use of an ice-bag for the night-sweats of phthisis. The ice-bag is applied over the abdomen for several hours during the night. This treatment is said to be successful even in cases where atropine and salicyl are not serviceable, and its continued use is well borne by the patients.—*Wiener klinische Wochenschrift*, June 27, 1889.

A NEW METHOD FOR DETERMINING THE ACIDITY OF THE GASTRIC JUICE.

Although many methods for the determination of the degree and nature of the acidity of the gastric juice have been advanced in the past few years, most of them have, on extended trial, been found lacking in certain important respects. Thus, while nearly all are good tests for hydrochloric acid when alone, many have the disadvantage of having their delicacy interfered with by the presence in the fluid to be tested of certain bodies, such as the peptones, ammonium salts, chlorides, etc., which seriously impair their usefulness for the general practitioner. LEO, after considering the disadvantages of most of the tests at present employed (*Centralblatt f. d. med. Wissenschaft*, No. 26, 1889), proposes a new method, which, from its simplicity, promises to be of much use. The principle on which the test is based is the following: If to a solution of acid phosphates (this turns litmus paper red) calcium carbonate be added, no reaction takes place, and the litmus paper will remain unchanged. But if the solution contain in addition some free acid, the litmus paper will, after the addition of the calcium carbonate, no longer be turned as red as it was on the first trial, owing to the neutralization of the free acid by the lime salt. The application of this principle is as follows: A slip of blue litmus paper is moistened with a drop of the gastric contents and kept for a comparison of color. A few drops of the contents are then placed in a watch-glass, a small quantity of powdered calcium carbonate added, and the reaction to litmus paper tested again and compared with the original. If the litmus paper is now no longer reddened, then the original acidity was due wholly to free acids. If the resulting redness is less than before, it was due in part to free acids and in part to acid salts. If there is no change, the original acidity was due wholly to acid salts.

If the gastric contents be previously extracted with ether to remove lactic and the fatty acids, and if then a free acid be found, it may be set down as being hydrochloric.

This test has given good results in the hands of its originator, and is well worthy of a trial. It can also be used quantitatively, for which see the original article.

GASTRIC DIGESTION IN CHRONIC AFFECTIONS OF THE RESPIRATORY APPARATUS.

CHELMONSKI (*Rev. de Méd.*, No. 7, 1889) has occupied himself with the question of the nature of the gastric secretion in phthisis, emphysema, and chronic bronchitis, examining such cases as were under his care, without reference to whether or not evidences of gastric derangement were present, but excluding cases exhibiting fever, since, as is well known, fever of itself alters the condition of the gastric secretion. Considerable difficulty was found in obtaining the secretion, the operation often producing alarming dyspnoea, or causing hæmoptysis. The method followed was usually that of Riegel, the gastric contents being removed at from three and a half to five hours after the meal. In some cases the operation was done one and a half hours after the breakfast of Ewald. The test employed was usually that of Günzburg, which the author considers the most delicate. In some instances other tests were also applied.

The author sums up his conclusions as follows :

1. In the course of chronic phthisis, and independently of the fever, there is often found an absence of free hydrochloric acid in the contents of the stomach, and a very small amount of pepsin. This composition of the gastric juice probably depends in part on anæmia of the stomach, due to the general cachexia and to a chronic fibrous endarteritis ; and in part on a passive hyperæmia of the stomach, or rarely on an amyloid degeneration of the mucous membrane and of the arteries.

2. In emphysema of the lungs the contents of the stomach are often without free hydrochloric acid, and contain only a small quantity of pepsin. It would seem that this condition is intimately connected with stasis in the gastric circulation, and for this reason is not constantly present in the same case.

3. The changes which have been described in the composition of the gastric juice have no connection with the symptoms of chronic dyspepsia ; it has been proved that when the insufficiency of secretion is due to some local cause the chemical action of the stomach is replaced by that of the pancreas. When, on the other hand, the deficient gastric action is due to a general condition, as in fever, any cachexia, or stasis in the abdominal cavity, it is probable that the action of all the digestive glands is affected as well. It is clear that such a secretory insufficiency must sooner or later react on the general state of the organism. That the nutrition of patients with emphysema remains so good is due to the inconstancy of the secretory insufficiency in this disease.

CALOMEL AS A DIURETIC IN HEPATIC CIRRHOSIS.

HEINRICH KOHN (*Centralbl. f. d. ges. Therap.*, May, 1889) reports a case of this affection, which is of interest as an aid in determining the exact value of calomel as a diuretic. The patient had been treated with various diuretics without notable effect, and eventually needed aspiration, but was unwilling to undergo it. The administration of 0.2 gramme of calomel three times a day was then commenced, guarded by opium, and with the simultaneous employment of a mouth-wash of chlorate of potash. Under this treatment;

continued for three days, there developed great weakness and exhaustion which necessitated its discontinuance. In the meantime, however, there had been a very marked diuresis, and the ascites was almost entirely removed.

NEPHRITIS AND ALBUMINURIA IN THE TYPHOID FEVER OF CHILDREN.

GEIER (quoted in *Arch. of Pediatrics*, June, 1889; from *Jahrb. f. Kinderh.*) analyzed a series of twenty-five cases in which typhoid fever in children was slowly about ten ounces of warm fresh milk. Two hours after the operation there was a marked improvement in the appearance of the patient, and four and a half hours after it she swallowed and retained stimulants. In twenty-five days she was able to sit up.

The author was led to employ this anomalous treatment on the ground that the carbonic oxide in the blood had destroyed the red blood cells, so that they could no longer absorb oxygen. It therefore seemed desirable to reduce the amount of carbonic oxide present, and to dilute the remaining portion; milk being a convenient and suitable substance for this purpose.

SIGNS OF THE MORIBUND CONDITION.

JOHN SHRADY (*Medical Record*, June 8, 1889, 626), after dwelling on the expediency of an early recognition of impending dissolution, passes in review the most important death-signs; some antecedent by a considerable time, affected, appear to lead in children to the development of nephritis, when they are followed by typhoid fever.

4. Fever, albuminuria, and nervous symptoms in typhoid fever are the result of one and the same cause, namely, the intoxication of the organism with the poison which is developed from the typhoid bacillus.

THE TOXICITY OF THE URINE IN PNEUMONIA.

ROGER and GAUME (*Rev. de Méd.*, April and May, 1889) contribute a long article on this subject. Referring first to the experiments of different writers, which have shown that the urine of persons in a normal state of health is poisonous to animals when injected into their veins, they report experiments with the urine of eleven cases of pneumonia conducted with the object of determining whether there was any modification of the toxicity in this disease. They sum up the result of their studies as follows:

A person suffering from pneumonia eliminates three to four times less poison than when in a state of health. At the moment of defervescence the urinary toxicity increases suddenly and attains or surpasses the normal rate. The urotoxic discharge characterizes the urinary crisis, and is the only constant phenomenon. It lasts twenty-four or forty-eight hours, and attains its maximum on the day of the thermic crisis, or more rarely on the following day. After the defervescence the urine again becomes very little toxic, descending suddenly or gradually to the normal amount.

Potash plays an important rôle in the toxicity of the urine in pneumonia. It is the principal factor during the febrile period, but as its amount increases either not at all or inconsiderably at the time of defervescence, it cannot explain the urotoxic crisis. The physiological analysis shows that the toxicity

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NEW METHOD OF TREATMENT OF WATER GAS POISONING.

D. A. CLEAVELAND (*Boston Medical and Surgical Journal*, cxxi. No. 2, 29) says that there has been an increasing effort on the part of interested parties to introduce plants for the manufacture of this poisonous gas. The symptoms presented by persons affected by the inhalation of water gas do not differ widely from those seen in those individuals deeply unconscious from the effects of other lethal poisons, except that the coma is more persistent and profound, and continues for several hours with no marked change until near the end of life; then a sudden change in the respiration, a rapid failure of the heart's action, a few forcible respiratory movements, and the patient is dead. It is the carbonic oxide contained in it which is its principal poisonous constituent. Water gas is so much more dangerous than coal gas, because it contains an average of 27.46 per cent. of this substance, while coal gas has an average of but 5.53 per cent. It is on this account that there is usually but little difficulty in resuscitating persons poisoned by the ordinary illuminating gas.

In view of the dangerous nature of water gas, and the perils attending its employment, and as all methods hitherto adopted to resuscitate persons deeply under its influence have been useless, the author is induced to report a case in which he employed a new method with success. The patient, when first seen by him, was apparently moribund, in profound coma, with livid face and cold extremities. The pulse would beat 8-10 times with tolerable fulness, and then run down to a mere flutter, and for a moment be entirely lost at the wrist. The respiration corresponded with it in character. There were spasms of one side of the face, and the sound of rattling mucus in the throat. For

continued for three days, there developed great weakness and exhaustion which necessitated its discontinuance. In the meantime, however, there had been a very marked diuresis, and the ascites was almost entirely removed.

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JOHN SHRADY (*Medical Record*, June 8, 1889, 626), after dwelling on the expediency of an early recognition of impending dissolution, passes in review the most important death-signs; some antecedent by a considerable time, others occurring not long before the end comes. A very certain sign is the suppression of the catamenia as a diversion in favor of the acknowledged vital functions. This may occur months before the catastrophe arrives. Colliquative diarrhœa with muscular relaxation comes on much later, and is a less important sign, needing corroboration by other signs, such as epistaxis or hemorrhagic alvine discharges, as in typhoid fever, or purpuric spots, as in the malignant forms of the exanthemata. Shrunken retinal arteries and a pallid disk are more important. An abnormal appetite may be noted in the last stages of phthisis, in low fevers, and in cerebral complications. It may be interpreted as an intuitive desire to overcome the sense of extreme exhaustion. Optic delusions, such as picking at the bedclothes, extreme muscular prostration, and subsultus tendinum, are most unfavorable signs, and the dilated, glazed eye, and the relaxed smile are still later signs of the approaching end.

An intermittent pulse is nearly always an alarming symptom, especially when it occurs in the course of a debilitating disease. The writer has in more than one instance, as in cancer and in consumption, known it to be a virtual herald a fortnight before the occurrence of death. In all dubious cases the sphygmograph might prove of great prognostic value. After the intermittent pulse may appear many quite obvious signs, such as an ashy tint of the face, purple-hued nails, the distinctive white lines around the orbicularis oris seen in serious forms of scarlatina, the whispering voice, pleading look, and grunting respiration. All these are signs of a hindered circulation. Subsultus tendinum, hiccough and convulsions, which appear later, are manifestations of the disordered nervous system.

Left unilateral dropsy beginning in the foot is a very valuable sign of the gradually approaching end. Conjoined with this may be noticed a coolness

of the ears, tip of the nose, and malar regions ; to be followed, much later, by coldness of the patellar surfaces. These symptoms may come and go for weeks at irregular intervals, but are ominous of evil. The state of the temperature is a matter of importance. A temperature of 105° F., long maintained, renders the prognosis unfavorable with but little qualification. On the other hand, a temperature below 95° is usually quoted as being very serious.

Coma is to be regarded as among the surest signs of approaching death. A rate of respiration thrice the normal, and continuous, also renders an unfavorable prognosis the rule ; the only exception, and that a partial one, being in uræmic asthma. Cheyne-Stokes respiration, like uræmic asthma and the exhilaration of uræmic poisoning, may exhibit itself at short intervals.

Of all the signs of dissolution a persistent up-and-down movement of the *pomum Adami*, as temporarily seen in the act of swallowing, is the most valuable. It appears very early in certain forms of the dissolutive state, usually in the period of tracheal râles. In phthisis it may precede the catastrophe even a fortnight or longer. When appearing in diphtheritic croup neither tracheotomy nor intubation is available ; this statement having the force of a rule. This sign has been used with success in distinguishing between drunkenness and compression of the brain, being always absent in the former, and present in the moribund condition.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA ; SURGEON TO THE UNIVERSITY
PHILADELPHIA, AND GERMAN HOSPITALS.

THE ANTISEPTIC TREATMENT OF WOUNDS.

A brief *résumé* is given (*Centralblatt für Chirurg.*, 1889, No. 34) of the wound treatment adopted by von Bergmann, Mikulicz, and H. Schmid, all eminent surgeons and representatives of the advanced thought of Germany.

VON BERGMANN requires the patient to be thoroughly cleansed with soap in a warm bath, after which he is brought immediately to the operating-table, shaved, washed with alcohol, or with ether, if necessary ; and, finally, the field of operation is washed with bichloride of mercury, 1 : 500, and surrounded with towels wet in the same solution. The operating-table is covered by a sterilized cloth. Operators and assistants cleanse their hands according to the method pursued in regard to the operative field. Everything which can come in contact with the patient—clothing, scrubbing brush, etc.—is previously sterilized by superheated steam, except the sponges, which are washed in boiled water and soaked in bichloride solution. The instruments are sterilized by carbolic lotion. For ligatures and buried sutures sublimate catgut is used. For superficial sutures, sterilized silk is employed.

Since the air of the ordinary clinic room is rich in pathogenic organisms,

the wound should be carefully protected during operation by sublimate compresses. Absolute hæmostasis is insisted upon, even slight oozing in connective tissue or bone cavities being checked. The wound is then irrigated with 1:2000 sublimate solution, dried by means of sterile gauze compresses, drained, closed, and dressed with sterile gauze containing no antiseptic, absorbent cotton, and a moss pillow. These dressings are sterilized by means of heat. If the wound is already infected, it should be opened freely, cleansed, drained and counter-drained, packed loosely with iodoform gauze, and dressed with sterilized gauze and the moss pillow. The superficial dressing is changed, but the packing is not disturbed unless it becomes wet and dripping. In that case it is removed and a drainage tube substituted for it.

After operations which leave the surgeon not quite sure as to the absence of infective matter in the tissues, or in case the bleeding has not been thoroughly checked, or where the wound is in a region difficult to keep germ-free, von Bergmann commends primary iodoform gauze tamponade with secondary suture.

Finally, after resections and arthrectomies performed for the cure of tubercular arthritis, the wound should be treated with ten per cent. iodoform ether, and tamponed with iodoform gauze; the latter to be removed in two days and the wound sutured without providing for drainage.

In contrast to von Bergmann's treatment, MIKULICZ commends, in many cases, Schede's method of obtaining healing (moist blood-clot).

The ordinary chemical antiseptics are used. Sponges are discarded for wads of sublimate cotton wrapped in mull, and kept in sublimate lotion. During the operation the wound is washed out with sublimate solution every five minutes. All bleeding vessels are tied, the wound finally thoroughly irrigated, first with five per cent. carbolic solution, finally with the bichloride of mercury lotion, closed by relaxation sutures of silk or silver and a continuous catgut suture, and dressed with protective or gutta-percha tissue, ten per cent. iodoform gauze wrung out in five per cent. carbolic lotion, and a moss pillow. In two places a little space is allowed between the sutures so that any excess of blood can escape. If there is a cavity left at the operation which cannot be closed by approximation of the wound surfaces, the space for the escape of blood must be left at the highest portion of the superficial incision. The bandage is usually not changed till the wound is entirely healed. After operation upon tubercular inflammations, Mikulicz recommends iodoform gauze, tamponade, and secondary suture. Of the 160 major cases treated by this method, Mikulicz has lost only one. This patient died sixteen days after operation of consumption. In only three cases did pain and high temperature force him prematurely to change the dressing.

SCHMID completely closes his wounds immediately and discards drainage. Should symptoms denoting tension or suppuration appear, he removes the dressing, takes out a stitch, and opens the wound somewhat. The site of operation is covered for twelve hours with moist sublimate compresses, and is finally washed with ether and sublimate solution. In every pause of the operation the wound is covered by sublimate sponges. There is no irrigation and the minimum of sponging. Most careful attention is given to checking the bleeding, after which the wound is flushed with bichloride solution, dried, dusted lightly with iodoform and approximated throughout its whole extent.

A compression sponge is now applied, iodoform, mull, and a moss pillow. The dressing is completed by a pressure bandage very firmly applied, which can be loosened if painful in twenty-four hours. In wounds where pressure is not necessary, salicylated collodion painted over the skin sutures will prove a sufficient dressing. For infected wounds, Schmid advises free opening, drainage, by means of iodoform gauze, and antiseptic poultices.

TREPHINING IN HEAD INJURIES.

To systematize, to some extent, the indications for trephining in case of head injury, ZEIDLER (*Wien. med. Presse*, No. 25, 1889) draws a sharp distinction between the local injury to the skull, and the secondary effect upon the brain. Since it is clearly proven that a depressed fragment of bone is in itself never sufficient to cause pressure symptoms, and since the cerebral effect produced by such depression is uncertain and transitory, trephining with the object of correcting such depression is never indicated. So far as the brain is concerned, the single indication for primary trephining is where we have pressure symptoms which are clearly due to internal bleeding.

As for the indications given us by the local bone injury, the single question for deliberation is that of infection; replacement is not for a moment to be considered. Hence it primarily follows that subcutaneous fractures, with or without depression, should never be trephined. In compound fractures, however, septic matters have ready access. Here trephining may serve a valuable purpose in enabling us to secure asepsis. It is to be regarded rather as a débridement, is accomplished by the chisel and saw where possible, and has precisely the same object that similar methods would have in compound fractures of other bones; namely, the placing of the wound in the most favorable condition for thorough purification and primary healing. Thus in a compound comminuted fracture of moderate extent all loose splinters are removed, the depressed bone is raised, the sharp edges are rounded, the opening in the skull enlarged, and the whole wound is carefully disinfected; or, in other words, the surgeon makes a careful débridement.

In more extensive fractures, a less active intervention is required. Bergmann's rule is, the more extensive the break, the less imperative is the indication for chiselling, elevation, or extraction of fragments. Fissures, even though accompanied by depression, require only disinfection and antiseptic dressing.

The following cases illustrate these statements.

I.—Child, æt. three years. Bitten by a dog. Five large scalp wounds varying in length from two to four inches. In the right parietal region a punctured comminuted fracture, with the splinters of bone driven inward. Dura not injured. A fracture over the longitudinal sinus with wound of the latter and copious bleeding, not stopped by long-continued pressure. Débridement with tamponade of the sinus. Suture of the wounds. On the sixth day complete healing. Of especial interest is it to note that continued pressure failed to check the bleeding from the sinus, which was not arrested until a tampon of iodoform gauze was thrust into it.

II.—Man, æt. fifty-one years. Comminuted fracture of frontal bone in region of frontal sinus, posterior plate of latter perforated, dura uninjured. Depressed fissured fracture passing upward to frontal protuberance. Dé-

bridement—tamponade. On the second day skin sutures removed on account of suppuration in the wound. Healing under tampon.

This case shows that the attempt at healing *per primam* should not be made in fractures involving the frontal sinus, but that the whole cavity should be packed with iodoform tampons. In a similar case of Wagner's, death from sepsis followed.

The indications for trephining in case of fractures already infected or suppurating, or complicated by meningitis, require careful consideration. If the meningitis is diffuse, operative procedure is, of course, useless; but in case of local encephalo-meningitis the prognosis is by no means absolutely bad. Punctured comminuted fractures, even though suppurating, should at once be subject to most rigorous débridement, and though a successful issue may be rare, its possibility is shown by the following case:

Patient æt. nineteen years. Comminuted punctured fracture of frontal bone. Fragments driven into brain. Entered hospital thirty-six hours after the injury. Incipient meningo-encephalitis evident. Temperature 102.4°. Thorough débridement. Evacuation of a purulent fluid mixed with brain substance. Careful disinfection. Consciousness returned a few hours after operation. Normal temperature from fifth day. Cure rapid and complete.

Wagner has reported two similar cases, and even if they be the rare exception, operation is imperatively demanded, since death is the absolute result of a more conservative policy,

As the result of a careful study of the subject, Zeidler draws the following conclusions:

1. Symptoms of cerebral pressure following head injury indicate trephining only when these symptoms point clearly to bleeding from the arteries of the dura.

2. Simple fractures of the skull, unaccompanied by symptoms of intracranial hemorrhage, never indicate trephining.

3. Depression of the bone in itself should not be considered as an indication for trephining.

4. The object of primary trephining is asepsis, or the checking of hemorrhage.

5. Secondary trephining is indicated in cases of beginning meningo-encephalitis.

6. Epileptoid attacks, due to the pressure of splinters of bone pressing upon the brain, should be relieved by removing these splinters.

7. In treating fractures which involve a sinus, the bleeding from the latter should be checked by tamponade, and not by suture.

8. The term débridement should be applied to the operative procedures necessitated by a complicated fracture of the skull, trephining being reserved for the formal operation upon the uninjured bone.

RESECTION OF THE UPPER JAW.

In place of the usual free incision for excision of the upper jaw, HEUSNER (*Deutsch. med. Woch.*, 1889, No. 8) advises a much smaller wound. Somewhat below the infra-orbital foramen he makes a cut an inch and a half long. By means of a chisel the infra-orbital canal is laid open, and the infra-orbital

nerve and artery are freed. By blunt dissection, carried on partly through the wound, partly through the mouth, the soft parts are freed from the bone. Division of the osseous processes is accomplished by means of the chain-saw.

In case of benign tumors this procedure might prove serviceable, though it should be borne in mind that the scar of the ordinarily extensive incision made in this operation is neither conspicuous nor unsightly.

EPITHELIOMA OF THE UPPER LIP.

ESCHWEILER (*Deutsch. Zeitschrift für Chirurg.*, Bd. 29, Heft 4) has carefully reviewed the literature bearing upon epithelioma of the upper lip. Heuter declares that this region is entirely exempt; the record of cases, however, proves positively to the contrary.

The rarity of disease in this portion is of decided importance from a bacteriological standpoint, for, epithelioma being a very common affection of the lower lip, were it dependent upon a specific microorganism, and infectious, its spread by surface contact to the upper lip would necessarily be frequently observed.

Bergmann states that the relative frequency of cancer upon the lower and upper lip is as $25\frac{1}{2}$ to 1. In the Bonne clinic this ratio is given as 17 to 1. At Cologne it is rated as 12 to 1.

The lower lip, as is well known, is much more commonly affected in men than in women. Bergmann stating that of a hundred cases ninety-one were men. Of sixty-one cases of this disease in which the upper lip was invaded, twenty-four were women.

The patients generally belonged to the laboring class. The average age was about sixty years. The left side was most frequently affected, next in order came the middle of the lip, and last the right side.

Pipe-smoking is generally regarded as directly causative, but a defect of the skin or want of protection of the epidermis, however produced, should be regarded as the true predisposing factor.

THE TREATMENT OF STENOSIS OF THE PYLORUS.

LAUENSTEIN (*Deutsch. medicin. Woch.*, June 27, 1889) reports two cases of pyloric obstruction successfully treated by operative means. In one a gastrointestinal fistula was formed on account of an inoperable pyloric stricture. The patient gained forty-one pounds in the six months following the operation. In the other case the lumen of the pyloric valve was nearly obliterated, but the tumor was freely movable. Pyloric resection was performed, the patient gained thirty-nine pounds in weight, and shortly resumed his work as locksmith.

Only after opening the abdomen can the operator determine the point as to whether operation is advisable, nor can he determine upon any method of operation till he has made his exploratory incision.

There are, nevertheless, certain points which are of great diagnostic value. From the mobility of the tumor, the extent of adhesions and the length of the duodenum can be inferred. If there are no adhesions the pylorus lies to the left when the stomach is empty, but is pushed far to the right when that

viscus is full. This movement does not positively prove the non-existence of adhesions, since it is obvious that attachment of the pylorus to the gall-bladder or transverse colon would not materially restrict motion.

These pyloric tumors are always most readily felt when the stomach is empty.

In regard to symptomatology, it must be remembered that clinically the symptoms of duodenal stricture are identical with those arising from pyloric obstruction. In spite of the high value attributed by many writers to chemical and microscopic tests, we must acknowledge that they have not proven of great service. For instance, free hydrochloric acid is frequently found in connection with gastric cancer, and may be entirely absent in cases of simple ulcer. Cachexia is of very distinct value.

Patients suffering from stenosing ulcers, especially men, aside from emaciation, often exhibit neither cachexia nor anæmia.

Gastroenterostomy, after Wölfler's method, is suited to cases of ulcer or carcinoma where pyloric excision is not possible or is too dangerous. The ideal operation is always resection and pyloroplasty. Loreta's operation is one which Lauenstein characterizes as not popular in Germany.

RADICAL CURE OF DIAPHRAGMATIC HERNIA.

A case of diaphragmatic hernia treated radically not by means of laparotomy, but through the thoracic cavity, is contributed by POSTEMPSKI (*Wien. med. Presse*, No 21, 1889). After some previous experiments upon the dead body, the operation was first essayed upon a young man suffering from a traumatic diaphragmatic hernia. There was a penetrating wound of the eleventh intercostal space. This was enlarged until the diaphragmatic opening was exposed. The edges of this opening were seized with pincettes, the prolapsed omentum was reduced, and the rupture was closed by means of sutures. The pneumothorax disappeared in twelve days, and in three weeks convalescence was complete.

LUMBAR HERNIA.

Since Petit's triangle (a triangular space bounded by the latissimus dorsi, the crest of the ilium, and the external oblique muscle) is wanting in about every fourth man, and is nearly always absent in children, J. HUTCHINSON, JR., (*British Medical Journal*, July 13, 1889) holds that the classical teaching in regard to the appearance of hernia in this anatomical region is not correct. In a case observed by himself the protrusion occurred at a point above and within this triangle.

Out of twenty-nine cases collected by Hutchinson, sixteen developed suddenly or were attributed to strain. All of these were in adults or elderly subjects. Practically, the spontaneous form of lumbar hernia is confined to the period of adult life or old age, while that due to abscess or traumatism may occur much earlier.

With regard to diagnosis, the main point is, to bear in mind that a hernia may occur in this region, since, from ignorance of this fact, the intestine has been actually incised.

A well-made abdominal belt will usually be all that is required in the way of treatment, although Owen has performed a successful radical operation upon a patient suffering from this form of hernia.

SPLENECTOMY.

MACCALL contributes a case of splenectomy (*British Med. Journal*, July 12, 1889) in which most careful examination both before and after extirpation of the spleen showed nothing abnormal in the constitution of the blood. The patient gave a history of malaria in childhood. The tumor first appeared in the left ovarian region and was about the size of a man's fist. A year later, the woman having meantime given birth to a child, and having been much reduced in health by mammary abscess, the tumor was found in front of the uterus, extending from the pubes to the umbilicus, and measuring fully nine inches transversely. It was slightly movable and evidently not attached to the uterus. The patient was referred to Sir Spencer Wells, who diagnosed the tumor as an enlarged displaced spleen.

In the course of another month there had been a sudden and rapid enlargement of the tumor, followed by a sharp attack of peritonitis. The marked constitutional symptoms attending the onset of the attack suggested that there had been a hemorrhage confined within the splenic capsule. The peritoneal inflammation subsided, but the enlargement was so great, the dyspnœa, pain, and vomiting so wearing on the patient, that aspiration was advised, and ten pints of a thick, reddish-brown fluid were drawn off. Reaccumulation was exceedingly rapid. On account of this, and because of the patient's failing strength, a formal operation was performed by Sir Spencer Wells. In the course of the operation the cyst-wall was ruptured and about eight pints of fluid, similar to that aspirated, escaped. The solid part of the tumor, consisting of hypertrophied spleen tissue, weighed four pounds.

There were extensive adhesions, so firm in one place that a portion of the cyst-wall was not removed. No drainage-tube was used, the wound being finally closed with silk sutures, which included sac-wall, peritoneum, and integument. The temperature was 100° F. on the day following the operation, subsequently normal. In seven days there was a purulent discharge, very offensive, which escaped with some force and in considerable quantity on removing a stitch. This was subsequently followed by an obstinate and prolonged attack of vomiting, yielding only to rectal alimentation. On the subsidence of this complication recovery was practically uninterrupted.

Examination of the blood on the morning of the operation demonstrated no abnormality. Another examination, made more than a year after the spleen had been removed, showed that to each cubic millimetre there were 4,500,000 red corpuscles and 7000 colorless corpuscles. The hæmoglobinometer gave between 75 and 80 per cent. of hæmoglobin.

EXTIRPATION OF THE KIDNEY FOR MALIGNANT TUMORS.

Sixty-four cases of malignant kidney disease are collected by ALBERT SIEGRIST (*Correspondenzblatt für Schweiz. Aerzte*, August, 1888), in sixty-one of which nephrectomy was performed. In the remaining three cases explor-

atory incision showed that the operation was not practicable. In 52½ per cent. of these cases death followed immediately upon the operation. Of the remainder, 15 per cent. perished, within eighteen months, of recidivity or metastasis. Sufficient time has not elapsed to determine the percentage of permanent cures; but Krönlein's patient was in good health four years after the operation, and four other patients have been free from trouble for two years.

The mortality of intra-peritoneal operation is much greater than in the extra-peritoneal method; 58 per cent. in the former against 27 per cent. in the latter. In so far as recidivity is concerned, however, the figures are entirely reversed—being 5 per cent. for intra-peritoneal excision against 41 per cent. for the extra-peritoneal operation.

Siegrist commends Israel's method of exploration as most successful in examination of the kidney. The patient lies upon the sound side, beneath which a thick roll or pad is thrust, while the body is turned to a half abdominal decubitus. The fingers are now pressed beneath the lower border of the ribs on the bulging side, and can readily palpate the kidney during deep inspiration.

The frightful mortality of these operations can be avoided—by refusing to attempt hopeless cases; by early diagnosis and surgical interference; by strict adherence to the extra-peritoneal method.

TUBERCULAR CYSTITIS.

To the few recorded cases of operative treatment for tubercular cystitis REVERDIN (*Annales des Maladies des Organes Génito-urinaires*, t. vii. No. 6) adds yet another of especial interest because the tubercular lesions were not limited to the bladder. Unfortunately no bacteriological examinations of the urine were made, but the diagnosis was sufficiently plain from unmistakable lesions of the external genitals, from the excessively frequent micturition, from the intense pain, and from the hæmaturia.

The bladder was opened by the suprapubic incision without employing rectal distention, and was illuminated by an electric lamp. Some ulcerating points and fungous granulations were cauterized, the edges of the bladder incision were sutured to the skin, and the operation was completed by insertion of two rubber drainage tubes. The subsequent course of this case was satisfactory, except that a urinary fistula was left which was only closed with great difficulty after a long period, and from which a quantity of tubercular granulations were curetted. All bladder symptoms disappeared, except a tendency to frequent micturition, and the tubercular involvement of the external genitals remained localized. The patient subsequently developed a perinephritic abscess some three years after the operation, in spite of which he was apparently in excellent health at the time the case was reported.

INCONTINENCE OF URINE.

Guyon has long since shown the clinical value of the electrical treatment in the therapeutics of incontinence of urine. Unlike Weber, Manduit, and others who preceded him, Guyon applies the current directly to the mem-

branous urethra with the idea of increasing the tone of the true vesical sphincter, and has reported many brilliant cures as a result of this treatment.

JAMIN (*Annales des Maladies des Organes Génito-urinaires*, t. vii. No. 6) publishes a case in which electrical applications were equally serviceable in a young woman affected with nocturnal incontinence since infancy. This patient had been subjected to most thorough and exhaustive trials of all the ordinary remedies. The hope of amelioration with the appearance of the menses had not been realized. Belladonna pushed to its extreme physiological limit had been of no avail. Finally she reluctantly consented to local electrical treatment. This was continued for one month, the application being made every other day, and resulted in a complete cure. The urethral electrode (No. 16 olive-pointed) was attached to the negative pole, and was passed up and down along the whole extent of the urethra. The positive electrode was placed upon the thigh to avoid all action upon the bladder. Each séance did not last more than five minutes, and the current strength was not sufficient to cause pain.

FRACTURES OF THE NECK OF THE FEMUR.

SENN contributes a characteristically able article (*Journal of the American Medical Association*, August 3, 1889) upon fractures of the neck of the femur. Six years ago he published over fifty cases in which bony union after intra-capsular fracture had taken place, and practically demonstrated the fact that non-union was due more to inefficient treatment, to imperfect immobilization, than to any inherent peculiarity in fractures of this region. By means of experiments upon cats he showed that intra-capsular fractures treated by the ordinary expectant method, or by means of plaster-of-Paris casts, showed no evidence of bony union, while in those in which the fragments were pinned together by means of bone pegs, bony union, or union by means of an exceedingly short ligament, without any displacement of the fragments, was obtained. The fact that in impacted fractures satisfactory results are usual, is an additional proof that failure in these fractures is due to imperfect fixation. A brief anatomical study readily shows that the old method of extension and sand-bags neither approximates the fractures nor keeps them in fixed position.

The diagnosis of this fracture, when complete, is comparatively easy; if partial or impacted, however, it may become exceedingly difficult. The three cardinal symptoms to be considered are: the position of the trochanter major, shortening, and eversion. In all fractures, except the partial, the upper border of the trochanter major will be found above the Roser-Nélaton line (a line drawn from the anterior superior spinous process of the ilium to the tuberosity of the ischium).

The examination of the patient never requires the administration of ether, nor should the surgeon endeavor to elicit crepitus or preternatural mobility. The clothing having been removed as far as the chest, and the patient having been placed upon a hard, smooth, unyielding surface, careful measurements, aided by inspection and palpation, are usually sufficient to determine accurately the nature of the injury. The treatment advocated in fractures through any portion of the femoral neck consists in the fulfilment of two principal indications: (1) Immediate reduction. (2) Permanent fixation.

In impacted fractures, the second indication alone is regarded, no attempt being made to correct any of the displacements.

Since, in all intracapsular fractures, union is effected entirely by the production of intermediate callus between the broken surfaces, no external or provisional callus being formed, the mechanical support upon which coaptation depends must be retained much longer than would be necessary in other localities. In no case should the retention apparatus be removed in less than eighty or a hundred days.

Permanent fixation of an impacted fracture in the position in which it has been placed by the accident, is necessary for the following reasons :

1. It prevents disengagement of the fragments.
2. It obviates secondary shortening and eversion during the stage of interstitial absorption which attends inflammatory osteoporosis.
3. By keeping the injured parts at rest, it serves as a prophylactic measure against the accession of arthritis and para-arthritis.
4. It enables the patient to leave the bed any time after the dressing has been applied, and thus guards against decubitus, hypostatic pneumonia, and other affections incident to prolonged confinement in bed.

The advantages arising from immediate reduction and permanent fixation in fractures of the neck of the femur are the following :

(a) The untorn portions of the joint structures are replaced at once into their normal relations ; a procedure which cannot fail to influence favorably the circulation in vessels which may have escaped injury.

(b) The sharp and irregular margins of the broken surfaces act as irritants to the surrounding soft tissues ; immediate reduction, by placing the fractured surfaces at once into mutual coaptation, acts as a preventive agent against the supervention of undue inflammation in and around the hip-joint.

(c) With coaptation the process of repair is initiated at once, the blood and exudation material between the fragments act as a temporary cement substance, and, at the same time, serve a useful purpose in reëstablishing the interrupted circulation.

(d) Perfect reduction and permanent fixation prevent muscular spasm and diminish pain.

Senn originally proposed immobilization by means of a steel pin regulated by a screw passing through the centre of a curved steel bar incorporated in the plaster-of-Paris splint over the fenestrum. This pin was so arranged that its point would, by penetrating the bone, procure immobility of both fragments by lateral pressure. In some cases transfixion of both fragments by an ivory or bone nail was advocated. Clinical experience has since proven that the same object can be accomplished by well-regulated lateral pressure in the direction of the axis of the femoral neck, combined with perfect fixation of the lower fragment upon the pelvis.

The method of treatment is as follows : The fractured limb is incased in a plaster-of-Paris dressing as far as the middle of the thigh, the patient is then lifted out of bed and, supported on either side, stands with the sound leg upon a stool about two feet in height. An assistant takes charge of the injured limb and either holds it immovable in impacted fractures, or makes the requisite amount of extension if there is no impaction. In applying the plaster-of-Paris bandages over the seat of fracture, a fenestrum large enough

for the application of the lateral compress is left open over the great trochanter. Perfect immobility is secured by including in the plaster dressing the fractured limb, the pelvis, the opposite limb down to the knee, and the trunk as far as the cartilage of the eighth rib. The splint, which consists of a steel bar provided at the ends with lateral flanges and bowed out in the middle, is incorporated in the plaster dressing with the bowed portion directly over the trochanter major. This part is provided with a set screw which drives a stiff, well-cushioned pad so that pressure is made in the axis of the femoral neck. By this means a condition resembling impaction obtains in non-impacted fractures. In about three months the dressing is removed, but the patient is not allowed to put his weight upon the injured leg for one to three months longer.

Seven cases are reported in which the results of this treatment were gratifying in the extreme. The patients recovered almost complete functional activity in each instance.

In extreme obesity or debility, in patients suffering from concomitant fatal maladies, and in certain cases of fracture of the femoral neck, the treatment is not applicable, but in all cases where there is a reasonable hope that bony union may be obtained by fixation, it should be recommended.

Finally, as a result of his experimental and clinical study of the subject, Senn draws the following conclusions :

1. From a scientific, prognostic, and practical standpoint it is not necessary to make a distinction between intra- and extra-capsular fractures of the neck of the femur.

2. An impacted fracture of the neck of the femur will unite by bony union, provided the impaction is not disturbed and is maintained by appropriate treatment for a sufficient length of time for the fragments to become united by callus.

3. Impacted fractures of the neck of the femur should be treated by a fixation dressing consisting of a plaster-of-Paris case, including the fractured limb, the pelvis, and the opposite limb as far as the knee, in which a splint should be incorporated by which lateral pressure can be secured in the direction of the axis of the broken femoral neck.

4. Unimpacted fractures of the neck of the femur, both intra- and extra-capsular, should be treated by immediate reduction and permanent fixation, so as to place the fragments in the same favorable condition during the process of repair as in impacted fractures.

5. Reduction is effected most readily by auto-extension and traction upon the fractured limb with the patient in the erect position, resting his weight upon the sound limb.

6. The fixation dressing should not be removed and the lateral pressure should not be discontinued for from ten to twelve weeks, the shortest space of time required for bony union to take place.

7. Patients who have sustained a fracture of the neck of the femur should not be allowed to use the fractured limb earlier than four to six months after the accident, for fear of establishing a pseudo-arthritis at the seat of fracture.

8. The functional result is greatly improved by passive motion, massage, and the use of the faradic current.

Inner of the case

LIGATION OF THE INNOMINATE ARTERY BY MEDIAN INCISION.

For the now practically abandoned method of treating subclavian aneurism by ligation of the innominate artery, SPENCER (*British Medical Journal*, July 13, 1889) puts forward an earnest plea. That the operation is Hunterian in character cannot be doubted, and the fact that other means of treatment have been nearly as unsuccessful in result as this rather formidable operation, suggests that the latter should be carefully reviewed with the idea of determining whether the almost uniformly fatal result is inherent in the procedure, or is rather due to its imperfect application. To this latter idea the writer inclines, and a study of thirteen tabulated cases shows suppuration, distal hemorrhage or imperfect occlusion to have been the causes of failure.

Suppuration he proposes to avoid by a median incision dividing no muscular fibres, but separating the sterno-hyoids and sterno-thyroids in the median line. The right common carotid artery is then found, and, following this as a guide, the innominate artery is readily reached. This leaves no cavity, no blood-clot, and there is no necessity for drainage.

The artery should be absolutely occluded, and the inner coats ruptured by a strong, tightly drawn antiseptic silk ligature. Distal hemorrhage is to be avoided by synchronous ligation of the right common carotid artery.

Carefully observing this point, the author ligated the innominate artery of three monkeys. The animals were killed five weeks, ten weeks, and twelve weeks after the operation respectively, and the post-mortem examination showed that the artery was firmly closed by scar tissue. In another monkey a catgut ligature was used, and the carotid artery was not tied. The animal died on the seventh day from hemorrhage, due to distal perforation of the artery. This has been the immediate cause of death in man, and is to be avoided by ligating the carotid, thus allowing a proximal clot to extend as far as the origin of the vertebral artery.

In this connection a most interesting case of successful ligation of the innominate and carotid arteries is reported by LEWTAS (*British Medical Journal*, August 10, 1889). A month before admission to the hospital, a piece of gun metal had lodged in the patient's neck just above the clavicle. For three days there had been persistent bleeding from this wound. On examination, the outline of the right clavicle was obliterated by a tumor the size of a child's head, hard and non-pulsatile. There was a partly healed wound an inch in length just above the clavicle and in front of the attachment of the sterno-mastoid muscle. From this wound a brownish blood was oozing. A diagnosis of abscess beneath the deep cervical fascia was made, and the wound was enlarged. Digital examination showed the presence of a foreign body, which was removed by dressing forceps, and proved to be an irregularly shaped piece of steel, weighing three drachms. There was immediately an alarming hemorrhage, so profuse that the bleeding point could not be found. Finally, the finger passed to the bottom of the wound discovered an opening in the subclavian artery behind the anterior scalene muscle. Efforts at seizing this opening in hæmostatic forceps proving unavailing, an incision was made along the inner border of the sterno-mastoid muscle, the outer borders of the sterno-hyoid and sterno-thyroid muscles were notched, a catgut ligature was passed around the common carotid artery, and with the latter as

a guide the innominate artery was freed and tightly ligatured. The original wound cavity was partly cleared of clots and drained. The patient was so profoundly collapsed that he was taken to the ward before the completion of the operation; he remained senseless for two hours, but slowly reacted and was discharged cured on the forty-fifth day with no perceptible pulse at the wrist and only a feeble beat to be felt in the pulmonary artery.

Lewtas records this as a case of aneurism. His own notes would, however, show it to be a hæmatoma due to an injury to the subclavian artery.

OTOLOGY.

UNDER THE CHARGE OF

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A NEW PATHOGENIC MOULD FUNGUS IN THE HUMAN AUDITORY CANAL.

M. LINDT, of Berne, describes what he terms a new fungus in the human ear, and calls it the *Eurotium malignum*. The other forms of pathogenic fungi heretofore described, are the *Aspergillus fumigatus* (Fresen); *A. flavus* (Brefeld, Wreden); *A. niger* (v. Tilghem, Wreden), and *A. nidulus* (Eidam, Siebermann); to which the author claims to add a fifth.—*Archiv. f. Experimentelle Pathologie u. Pharmakologie*, Bd. xxv., and *Archiv. f. Ohrenh.*, Bd. 28, June, 1889.

ON THE TREATMENT OF AURAL EXOSTOSES.

The above was the title of the opening address by GEORGE P. FIELD, M.R.C.S., etc., before the Section of Otology at the annual meeting of the British Medical Association, at Leeds, August, 1889 (*British Medical Journal*, August 24, 1889).

The rarest form of aural exostosis consists simply in a general thickening of the walls of the osseous meatus. Usually only a limited area is affected. Their causation seems to be due to some local source of irritation of the ear. There are as yet no conclusive data that they are due to syphilis, scrofula, gout, or rheumatism. In many instances they are probably due to the irritation of the ear by salt water introduced repeatedly during a long course of sea baths.

The surgeon has to consider in any case of exostosis in the auditory canal whether an operation is necessary, and if so, how soon it should be undertaken. Mr. Field's experience is that it is far better to operate whilst there is room left to guide the drill, should that be required. The dangers of operating in an occluded ear are great.

The removal of a soft exostosis is comparatively easy, but "the destruction of one of the intensely hard, broad-based aural exostoses, or hyperostoses, apart from the exercise of considerable patience and a variety of precautions, and the employment of special measures, is an undertaking at once difficult, tedious, and uncertain."

The dental engine has been found by Mr. Field to be a "uniformly satisfactory" means of removing these growths. This engine is more under control, in his experience, when worked by the foot than by means of electricity. He prefers it greatly to the mallet and chisel.

THE CARE OF THE TEETH FROM A MEDICAL PRACTITIONER'S STANDPOINT.

Under this title, DR. SAMUEL SEXTON has contributed an interesting and valuable paper (*Medical Record*, June 1, 1889).

He confines his remarks to a consideration of dentition, caries of teeth, and some of the neuroses resulting therefrom. It is claimed that if "rational methods of research—such as have characterized the exact study of diseases of that group of special sense-organs comprising the ear, nose, and eye, and contributing so greatly to the success of specialism—were brought to bear throughout the field of oral surgery, the marked indifference of physicians toward this specialty would soon cease to exist."

Dental disturbances, of course, are most marked at the time of the first dentition, the completion of the second dentition at puberty, and the eruption of the wisdom teeth. It is claimed that the first period is often a time of exacerbation of ear, nose, or eye disease, and even of convulsions.

Second dentition may be a severe ordeal, and if children are badly fed or clad, or overworked mentally or physically, they are liable to give way under the strain. The exanthemata are badly borne at such times, and the nutrition of the teeth interfered with.

A number of such defects are known to occur with considerable uniformity, but "the writer has looked in vain for characteristically marked teeth which might be traced to any particular disease, such as have been described by Hutchinson as due to syphilis." Until all the second teeth are through, the teeth of the child should be kept under observation, "since many nervous affections are due to the physiological disturbances they give rise to, and being unattended by pain, are liable to be overlooked."

In the case of the wisdom teeth, "whether the pains of eruption are great, or absent altogether, the ear, nose, and tonsils often suffer very much from the long-continued irritation through nervous sympathy."

In regard to diseased teeth, and so-called dead teeth, their retention in the jaws is deprecated, since a very large number of persons coming under Dr. Sexton's notice, with diseases of the ear, could not be successfully treated until the affected teeth were removed. It is also maintained that there is a "danger to health from all fixtures, now so commonly worn in the mouth, requiring for their retention the remains of defective teeth, as caps, crowns, bridges, and other metal attachments. Pivot teeth, and transplanted or replanted teeth, are likewise more or less detrimental, as are also ill-fitting and vulcanite plates."

It appears that dentists are too often wanting in surgical knowledge, and that surgeons who take up dentistry are unable to acquire the practical mechanical skill requisite in dentistry. It is suggested in this paper that the "sooner a greater knowledge of oral surgery than generally prevails is made requisite for graduation by medical schools, the better it will be for all concerned." Also, it is further suggested that, "if medical schools undertake to educate dentists, it would be well to bear in mind the necessity for thoroughly equipped laboratories in which metal-working may be taught."

ANTISEPTICS IN THE TREATMENT OF OTORRHOEA.

DR. ROBERT L. RANDOLPH, of Baltimore, Md., has written a very interesting article on this subject (*Medical Record*, July 27, 1889). He prefers what he terms an acid solution of the bichloride of mercury to boric acid, iodoform, or carbolic acid. The following prescription is the one most frequently employed:

R.—Hydrarg. bichlor	.	.	.	.	.	.	gr. ss.
Acid. tartaric.	.	.	.	.	.	.	gr. xx.
Aquæ . . . . .	.	.	.	.	.	q. s. ad.	f 3vj.

The patient is first required to syringe out the discharging ear with warm water, and then to pour in the sublimate solution until the ear is full.

Acid is added to the solution of bichloride of mercury to prevent precipitation of albumen from the secretion in the ear. Its germicide power is rather enhanced than decreased by such addition of acid.

THE INFLUENCE OF THE FORM OF THE SKULL UPON SOME IMPORTANT TOPOGRAPHIC FEATURES IN THE TEMPORAL BONE.

OTTO KÖRNER, of Frankfurt-on-the-Main, has concluded, from an examination of twenty-nine skulls, that, first, the floor of the middle fossa of the skull in doliocephalic subjects is higher above the porus acusticus externus and the spina supra meatum than in brachycephalic skulls; and, secondly, that on both sides the sigmoid flexure of the transverse sinus in brachycephalic skulls lies deeper forward and outward in the bone than in the doliocephalic. Since, then, the sinus transversus in its sigmoid flexure lies deeper in the mastoid and the base of the petrous pyramid, on the right side than on the left, and as the more frequent occurrence of the sequelæ of caries of the petrous bone on the left side is thus explained, therefore the prognosis respecting the aforesaid sequelæ of otorrhœa in the brachycephalic is decidedly more unfavorable than in the doliocephalic. The author repeats his opinion, that in all cases of operative perforation of the mastoid, the opening should be made far forward in adults with a cranial index of 1.30 (*Zeitschr. f. Ohrenh.*, Bd. xix., and *Archiv f. Ohrenh.*, Bd. 28, June, 1889).

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF
J. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

HEMIATROPHY OF THE TONGUE.

DR. R. v. LIMBECK reports and illustrates (*Prager med. Woch.*, No. 16, 1889) a case of right-sided hemiatrophy of the tongue in a married woman, thirty-eight years of age, in which the causal central lesion was as yet limited to the nucleus of the hypoglossal nerve. There was a slight paresis of the right vocal band, but no appreciable lesion elsewhere.

PHARYNGITIS IN INFLUENZA.

DR. G. MERKEL has referred (*Münch. med. Woch.*, No. 21, 1889) to a great number of cases seen in hospital practice in which there was acute catarrhal pharyngitis without swelling of the tonsils, with slight congestion of the palate but with intense tumefaction and congestion of the posterior wall of the pharynx. Severe general pharyngitis began with a temperature exceeding 38° C. the first evening, and reaching 40° C. the second day, falling so on the third day that the temperature became normal in the evening. The pharyngitis subsided slowly, the patient recovering on the eighth day. There was no bronchial manifestations. Tumefaction of the spleen occurred often, but not regularly.

EXUDATIVE ERYTHEMA IN THE THROAT.

At a meeting of the Laryngologischen Gesellschaft zu Berlin, held May 10, 1889 (*Berliner klin. Woch.*, July 8, 1889) DR. SCHOETZ described under the title *Erythema exsudativum in den Halsorganen*, a unique case of sore throat in a merchant forty years of age, which began suddenly with fever and severe sore throat on May 26, 1888. Odynophagia followed, and increased in severity; and intense headache, rheumatic seizures in the legs, and profuse salivation soon became superadded, with occasional expectoration of small quantities of blood. On the fifteenth day of the disease the patient applied to Schoetz, complaining chiefly of his throat, and incidentally of discomfort in the head, noises in the ears, and pains in his limbs. There was intense general congestion of the mucous membrane of the mouth and pharynx. In the centre of the posterior wall of the pharynx was a flat ulcer the size of a five-cent piece, with yellowish-gray floor and adherent edges. A few discrete aphthous ulcerations occupied both surfaces of the gums of both jaws. The mucous membrane of the larynx was strongly congested and somewhat diffusely swollen. On the anterior surface of the posterior wall of the larynx, especially just beneath the left vocal band, there were projecting masses such as are seen

in *pachydermia laryngis*. There were no glandular swellings, nor was there anything abnormal in the remainder of the body.

Two days later the swelling in the larynx had undergone ulceration, the pharyngeal ulcer had enlarged, and a flat ulcer the size of a bean appeared on the vault of the pharynx, to the right of the middle line. The pains in the limbs were severe. An exanthem had appeared on the dorsal surfaces of the wrists and ankles, in the form of dark bluish-red papules, from the size of pin-heads to that of beans, with clear areola. This exanthem extended in a few days, under marked rheumatoid pains, over various portions of both upper and lower extremities, near the joints, which became markedly swollen. Efflorescences became developed at the tip of the nose, on the scrotum, and on the prepuce. The exanthem became irregular. While the ulcers in pharynx and larynx were undergoing cicatrization, two ulcers formed in the right half of the rhinopharynx above and behind the projection of the Eustachian tube. Considerable mucopurulent secretion, in part with sanious admixture, was discharged by the right nostril. The lower turbinated body became superficially ulcerated posteriorly. The fever increased, and there was great complaint of intense malaise, and of pains over the entire body.

By June 20th, the cutaneous exanthem had in great measure subsided. The old ulcers in the mucous membrane were in part entirely healed and in part partially healed. A fresh ulcer, the size of a bean, had appeared on the right tonsil; and papules had appeared on the left posterior palatine fold and on the gums, which ulcerated on the next day, when the process seemed to come to a standstill.

On June 26th, the patient went to Ems, where he became much worse. Fever recurred, fresh ulcers formed on various portions of the tongue, on the soft and hard palate, the lips, the cheeks, the right palpebral conjunctiva, the posterior wall of the pharynx, and the left ventricle of the larynx (Dr. Goltz); with fresh efflorescence on the extensor surfaces of the hands and feet, with moderate swelling of the joints.

The patient returned to Berlin, August 6th, with an additional fissure-like ulcer in the mucous membrane of the anus. Four days later, under the influence of warm weather, great improvement took place. With various changes, including ulcerations on the posterior surface and edge of the epiglottis, the condition continued practically unchanged until January 3, 1889, when marked exacerbation took place, quickly followed by permanent improvement. By January 13th, all the ulcers had healed. There were still moderate headaches, and contractures in the right heel. Since then the patient had had no complaint worth mentioning. The only remedy that had been efficacious was arsenious acid.

SYPHILIS OF THE PHARYNX, WITH MEMBRANOUS STRICTURE OF THE LARYNX.

P. HEYMANN exhibited to the Laryngologische Gesellschaft zu Berlin (*Deutsche med. Woch.*, No. 29, 1889) a lad thirteen years of age, who had been for three years under his treatment with syphilitic ulcerative lesions of the nose, upper lip, tongue, epiglottis, pharynx, and palate; and who had an ulcer on the hand. Though his condition had been much improved, the progress

had not been very satisfactory. The ulcer in the hand had completely healed. The ulcerative process in the tongue had completely terminated in cicatrization, and that in the pharynx was nearly complete. The ulcerations in the nose and upper lip had progressed steadily. A portion of the nose was completely destroyed, and the left nasal passage was completely closed by cicatricial contraction. A flat, red diaphragmatic membrane, starting from the stump of the epiglottis, just beneath its free border, stretched backward and downward; and under its posterior portion, the outline of the arytenoid cartilages could be made out. The laryngeal orifice, hardly of the size of a note-book pencil, was backward and to the side, and allowed a to-and-fro movement, attributed to the vocal bands, to be seen through it on phonation. Deglutition was not impeded. It was proposed to dilate the stricture. The child was the fourth of seven healthy children, both of whose parents were apparently healthy, without any indications or history of syphilis.

FRÄNKEL spoke of a similar case under his care, in which the diaphragm was located higher.

LUBLINSKI spoke of three cases he had reported in the *Berliner klin. Woch.*, No. 24, 1883, in each of which a membranous cicatricial new formation stretched from the base of the tongue to the posterior wall and sides of the pharynx. The openings in these membranes were three-quarters, one-half, and one and a quarter centimetres respectively. The worst two had been successfully operated upon, and in one of them whom he had examined eight years later, the relief had been permanent.

PHLEGMONOUS LARYNGITIS.

B. FRÄNKEL has reported (*Deutsche med. Woch.*, July 18, 1889) a rare instance of idiopathic phlegmonous laryngitis in an imbecile who, despite opportune tracheotomy, had died with oedema of the glottis which had supervened upon insignificant laryngeal symptoms of only a few days' duration. Oedematous infiltration was well marked in the epiglottis and in the ary-epiglottic folds. There were abscesses and phlegmonous infiltration of the submucosa in the region of the arytenoid cartilages. The right crico-arytenoid joint contained pus, and the arytenoid cartilage was laid bare in spots. In the region of the left posterior vocal process was a fistulous orifice representing the point of rupture of an arytenoidal perichondritis, the cartilage being largely loosened from its perichondrium. Microscopic examination of the mucous membrane revealed its thick infiltration with round cells, especially in the submucosa. There were no traces of syphilis on the body of the subject; and no tubercle bacilli could be detected in the pus or in the tissue.

INTUBATION OF THE LARYNX.

In an article on intubation of the larynx by O'Dwyer's method, DR. O. GUYER, assistant physician in the Children's Hospital of Zurich, comments favorably upon his own experience (*Correspondenzblatt für Schweizer Aertze*, July 1, 1889), having begun it with much misgiving.

Intubation had been practised in twenty-seven cases of acute stenosis of the larynx, all of them so intense that the only choice of treatment had been

between tracheotomy or intubation. Recovery ensued in thirteen cases; the two youngest of which were 8 and 13 months of age; two were 2 years old, two less than 4, three less than 5, three less than 6, and one less than 7. In all these children but the eight-months old babe, membranes had been expectorated, so that there was no doubt as to the diphtheria. In the fourteen fatal cases, the cause of death was extensive bronchial diphtheria in eleven; pneumonia in two, and nephritis in a girl eight years of age, after recovery from the diphtheria. Moderate bronchial pneumonia and turbid swelling of the kidneys were found in nearly every autopsy. The deaths occurred in one child of 1 year of age, in two of 1½ years, in four each of 2 and 3, three each of 4 and 5, two of 6, and in one each of 8 and 9. This success of forty-eight per cent. is much greater than had been attained previously by tracheotomy; and is much greater than the success reached in the United States.

The details of a few interesting cases are followed by warm commendations of intubation; which are confirmed in the appendix to the article by Dr. Wilh. v. Muralt.

TUBERCULOUS ABSCESES OF THE CRICOID CARTILAGE RUPTURING INTO THE TRACK OF THE TRACHEOTOMY WOUND.

DR. L. GRÜNWALD, of Munich, reports (*Munch. med. Woch.*, No. 21, 1889) an interesting case somewhat unusual in its initial stages and in the manner of rupture. A married woman, thirty-nine years old, came under treatment July, 1888, with slightly developed pulmonary phthisis. In September, there was great dyspnoea and loud tracheal stridor. There was great impediment in the abduction of the right vocal band, which was in the median position. One month later this band was in almost complete cadaveric position. The paralysis of the recurrent nerve was attributed to compression by infiltrated tuberculous tracheal glands, which likewise produced the dyspnoea by pressure on the trachea. Dyspnoea and spasmodic cough continued unchanged for nearly three months, when the breathing suddenly became free for several days, and then gradually became worse and worse so that the patient could breathe only sitting upright, and often pulled the epiglottis forward with her forefinger just to get breath. In this condition January 8, 1889, both vocal bands were seen to be symmetrical and freely mobile. The subglottis, however, was completely obstructed by two red tumefactions beneath the vocal bands and a third one beneath their commissure. There was no ulceration. The right half of the cricoid cartilage was painful to pressure. Tracheotomy was performed the next day. On January 14th the right bronchus could be freely disclosed by tracheoscopy from the wound. Ten days later dyspnoea recurred, and there was some difficulty with the canula owing to increase in the growth and its projection into the fenestrum. The voice was good, however, and there was no stridor. The swellings beneath the vocal bands had nearly disappeared. A portion of the subglottic growth was severed with a snare, and immediately a large quantity of thin pus escaped from the larynx and trachea. The abscess had been opened in the interior of the larynx by the removal of the mass of granulations. Pus could be pressed from the abscess, too, by pressure just above the tracheotomy wound, where there was a dense irregular tumefaction in the cricoid region. Profuse discharge of

pus escaped subsequently by the tracheotomy wound, showing that the abscess had ruptured into the wound shortly after it had opened into the larynx. The external tumefaction subsided by February 4th, and the laryngoscopic image became normal. The pulmonary disease progressed very rapidly in the exhausted patient, and death took place February 12th. The autopsy confirmed the diagnosis. A fragment of necrosed cartilage was found in the abscess.

A second case of rupture of the abscess through the tracheotomy wound was found by Grünwald in *post-mortem* examination of a man forty-seven years of age, who, after many years suffering with laryngeal tuberculosis, had been tracheotomized in December, 1887, and had died February 18, 1889.

CARCINOMA OF THE ŒSOPHAGUS.

At a meeting of the Berliner medicinischer Gesellschaft, Dr. EWALD exhibited (*Münch. med. Woch.*, No. 21, 1889) an œsophagus with carcinoma, in which a large diverticulum was found below the stenosis. The walls were very much thinned by shrinkage of the mucous membrane and atrophy of the muscles, so that a stasis of the ingesta had taken place, the weakened musculature having lost the power to force the food further, which therefore remained a certain time in front of the cardiac orifice.

SOME SUCCESSFUL WORK IN ŒSOPHAGOSCOPY.

DR. V. HACKER reports some interesting personal experience (*Wien. klin. Woch.*, No. 23, 1889) in Billroth's clinic. In a man thirty-one years of age, who for five months had symptoms of œsophageal stricture, the cause was discovered by means of a straight tube and Leiter's panelectroscope; and several excrescences around the ulcerated circumference of the stricture were removed with forceps for microscopic examination. In strictures from caustic lye and the like it is not easy to practice œsophagoscopy. In one instance HACKER states that he had obtained from his master the following account of his method of performing the operation. He states that the operation is not a difficult one, and that the patient is not in any danger. He would perform the operation only in cases where the favorable surroundings, which favor the success of the operation, are available and prepared to be obtained, and that the patient should be well supplied with food and has been informed of the dangers of the operation. The operation is generally performed by a physician who has had previous experience in occluding infiltrated places in the mucous membrane, and the exulcerated portions and the excrescences. In three cases particles had been removed with forceps for microscopic examination. In two cases of carcinoma incarcerated pieces of meat had been detected and extracted with forceps.

In two cases foreign bodies had been detected in the normal œsophagus; in one instance a denture, which was removed through the tube with forceps; in the other a large mass of meat, which had glided into the stomach by peristalsis on being touched with the forceps.

In two cases of dysphagia without stricture and attended with detention of food and regurgitation, the mucous membrane of the cervical portion of the œsophagus appeared as though longitudinally scorched in one instance; and

in the other several fissures were seen in the lower portion. This suggested that spasmodic contracture of the œsophagus might take place in fissure analogous to the contractions which take place in fissure of the anus. A case in point was narrated in which carcinoma of the cardia had been diagnosed in a man who had been in the habit of chewing and swallowing chicken bones; and post-mortem examination revealed changes due to injuries thus produced, but no carcinoma.

SYPHILIS OF THE NOSE.

LUBLINSKI reports (*Deutsche med. Woch.*, July 18, 1889) a case beginning with swelling of the tip and occlusion of one of the passages, fifteen years after a primary infection which had been promptly cured without subsequent manifestations. Granulations filled up the passages, and there was complete destruction of the cutaneous, and partial of the cartilaginous septum.

OBSTETRICS.

UNDER THE CHARGE OF

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VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL.

THE MOST PROBABLE TIME OF CONCEPTION.

SCHNEIDER (*Memorabilien*, August 7, 1889) considers the period just before the menstrual flow, when the ovum has escaped from the ovisac and is traversing the Fallopian tube, and, following this, the period during which spermatozoa retain vitality in the genital passage of the female, to be the time of conception. In the case of a patient who had been married for several years and who had been unable to conceive, he examined her on January 8, 1889, both vaginal hands were found to be symmetrical and free from nodules. The subglottis, however, was completely obstructed by two red tumefactions beneath the vocal bands and a third one beneath their commissure. There was no ulceration. Tracheotomy and removal of the growth was painful to pressure. Tracheotomy

HEGAR'S DILATORS, OF LARGE SIZE, FOR INDUCING LABOR.

LEWERS (*Lancet*, August 3, 1889) has used Hegar's dilators of large size, especially constructed for the purpose, for inducing labor. The series usually employed stops at No. 26; Lewers' series continues to No. 40, the largest measures one and three-quarters inches in diameter. When the largest has dilated the cervix the membranes are ruptured. A preliminary antiseptic vaginal douche is given, and the bougies are introduced in succession, the intervals becoming longer as the bougies increase in size. Barnes's dilators may be used to advantage if the largest of the series fails to induce pains.

Lewers reports three cases in which these dilators were used most satisfac-

torily. In the first the flexible bougie failed to induce labor and the dilators succeeded; the patient's previous children had been so large that they perished in labor, although no pelvic deformity existed. Labor was induced in the thirty-fifth week, and mother and child recovered. In the second case labor was induced by this method because previous labors had resulted in the death of the fœtus, which had always been of excessive size. Spontaneous delivery followed the induction of labor and mother and child recovered. In the third case labor was induced at the thirty-second week for contracted pelvis, caused by multiple deformity from arthritis of the knees and hips. Mother and child recovered, the head being delivered by the forceps when it reached the pelvic floor.

During the induction of labor the vagina is disinfected by repeated douches. The dilators lie in a porcelain tray immersed in a $2\frac{1}{2}$ per cent. solution of carbolic acid, and are dipped in terebene oil 1 : 5 before insertion. Sims's speculum is used to expose the os uteri, and tenaculum forceps used if required.

EXTRA-UTERINE PREGNANCY, WITH SPONTANEOUS RECOVERY.

THOMPSON (*American Journal of Obstetrics*, August, 1889) reports the case of a primipara who suffered from disordered menstruation, with attacks of pain and prostration, sometimes accompanied by a vaginal discharge. After a year's illness a tumor about as large as an orange was formed low in the abdomen on the left side; it was thought an ovarian cyst or a fibroid. A month later the abdomen suddenly increased in size, with abdominal pain; cystitis developed and was attended by the passage through the urethra of a number of small, hard bodies, which were found, by microscopical examination, to be fœtal bone. Gradual improvement, and finally restoration to health followed, with resumption of menstruation.

THE INDICATIONS FOR THE CÆSAREAN AND PORRO OPERATIONS.

PISKACEK sends us a recent reprint from the *Wiener klinische Wochenschrift*, 1889, giving an account of Breisky's method of performing the Porro operation in his clinic at Vienna, and stating indications for this and the Säger operation. He would perform the Säger operation only under the most favorable surroundings, when delivery through the natural passages is impossible and proved so by observation, and when the mother greatly desires offspring and has been informed of the dangers of the operation; it should generally be performed on multiparæ who have lost children in previous dangerous labors. In primiparæ Cæsarean section should not be done except when there is imminent danger of uterine rupture. In other cases craniotomy is clearly indicated.

The Porro operation should be performed in cases where the *conjugata vera* is less than two and three-quarters inches, as repeated pregnancies would necessitate repeated Cæsarean operations, and in each such pregnancy there would be danger of uterine rupture; and also in osteo-malacia.

It was performed by Breisky as follows: After the patient was cleansed and disinfected and the vagina filled with iodoform gauze, the uterus was turned out through the abdominal incision and an elastic ligature placed about the cervix; the abdomen was temporarily closed behind the uterus by several

stitches. The fœtus was removed through uterine incision. An acupressure needle was then passed through the cervix over the ligature and an écraseur passed below the needle and a second above it. Uterus and ovaries were then removed, and both écraseurs tightened until the pedicle was bloodless. Before the final adjustment of the écraseur wires the abdomen was closed with silk, only the lowest stitch being silver wire, to bring the peritoneum as far internal as possible: in none of Breisky's 11 cases were the parietal peritoneum and that of the pedicle joined. The écraseurs were then tightened, the uterus removed, the mucous membrane of the cervix partly excised to prevent fistula, and the stump cauterized with Paquelin's cautery. It was dressed with plaster-of-Paris and oil of cade, 100 to 15. Mummification always ensued, without complication. A heavy antiseptic dressing was then applied, and the stump allowed to remain undisturbed for a week or more if the patient had no fever. When the dressing was removed the stump was usually found in dry, odorless necrosis.

The description of 5 Porro operations and 4 Säger sections is appended. Breisky's statistics number 11 Porro operations, with no mortality.

TWO SUCCESSFUL SÄGER SECTIONS FOR CONTRACTED PELVIS.

WOLCZYNSKI (*Wiener klinische Wochenschrift*, No. 27, 1889) reports two successful Säger sections for contracted pelvis. The first was a flat, rachitic pelvis, *conjugata vera* 1.8 inches, in which the mother was but two and a half times larger than the fœtus. The operation was done by Säger's method, when the pains began; to prevent protrusion of the intestines, temporary stitches were taken through the abdominal wall before the uterus was turned out of the abdomen. The second case was that of a pelvis of high degree of osteomalacia, in which the operation was typical, after Säger's method. Prompt recovery followed in both patients. In the latter the mother was only eight or nine times larger than the child, the normal ratio being 1 to 20.

HÆMATOMA OF THE VULVA CAUSING RETENTION OF THE PLACENTA.

CHAZAN (*Centralblatt für Gynäkologie*, No. 30, 1889) reports the case of a multipara, to whom he was called three hours after labor because of retained placenta. On examination, a hæmatoma as large as a child's head was found in the right labium, of one and a half hours' duration. It was thought best to deliver the placenta before opening the hæmatoma, if possible. While this was being done the tumor ruptured at its most dependent part. The slight hemorrhage which followed was easily checked by a carbolized tampon. The tumor was gradually absorbed. Fever was present for eight days, but in fourteen days absorption was nearly complete, and a good recovery ensued. The cause of the hæmatoma could not be ascertained.

POST-PARTUM SHOCK FROM COMPRESSION OF THE OVARIES.

FERGUSON (*Edinburgh Medical Journal*, July, 1889) reports three cases of post-partum shock in young healthy women of nervous temperament, in two of whom chloroform was given and the low forceps operation was made; in each the placenta was expressed by Credé's method, and during this pro-

cedure shock so severe as to be most alarming occurred. This endured about three hours; the patients recovered with most active stimulation.

Compression of the ovaries against the uterus in expressing the placenta by Credé's method is thought to have caused this shock: to avoid it, the patient lying on her back, the hand should be passed into the brim of the pelvis obliquely, the ulnar side being pressed deeply down toward the left sacro-iliac synchondrosis, while the thumb should be behind the right ilio-pectineal eminence, the fundus resting in the palm. With the patient on her left side, the hand naturally grasps the uterus obliquely and the danger is less.

AUTO-INFECTION IN PUERPERAL CASES.

At the last meeting of the German Society for Gynecology, KALTENBACH (*Münchener med. Wochenschrift*, No. 25, 1889) expressed his belief that while in the great majority of cases infection comes from without, yet the innocuous bacteria found in the vagina may invade the uterus and become pathogenic, especially if the tissues be mechanically injured or destroyed during labor, and absorption of the products of retrograde metamorphosis follows. The attempt to sterilize the genital tract is unnecessary and meddlesome, but a vaginal douche of bichloride of mercury, 1 to 3000, had done him good service, and is used to advantage in protracted cases. The necessity for intra-uterine douches becomes very infrequent when prophylactic douches are given.

FEHLING considered many cases of fever in puerperal patients, examples of the absorption fever common in surgical patients, in whom absorption of disintegrating albuminoids, with or without germs, was not rare. In the presence of an abundance of such matter, harmless germs often become virulent. He lays most stress on disinfecting the external parts; the vagina is irrigated only when foul lochia are present. Should the placenta or chorion be retained, interference is demanded. In all labors care is taken that the membranes do not rupture too soon; that perineal tears are avoided by episiotomy; and that the forceps is used before the tissues have been injured by pressure.

PUERPERAL ECLAMPSIA AT TERM AND AT SIX MONTHS.

At a recent meeting of the Boston Obstetrical Society (*Boston Medical and Surgical Journal*, August 15, 1889) BRODERICK reported a case of eclampsia at term, treated successfully by morphia, chloral, hot-air baths, ether by inhalation, and manual dilatation and version; the fœtus perished. Post-partum hemorrhage was controlled by ergot, uterine massage, and ether hypodermatically.

COLLINS reported the case of a primipara pregnant six months, in whom uræmic eclampsia was treated by manual dilatation and craniotomy; post-partum convulsions continued, and were treated by pilocarpine, digitalis and brandy, and anæsthesia; hot-air baths were employed early in the case. Death occurred, with high temperature.

In discussion, two hours was thought the average time needed for manual dilatation of the cervix. Continuous anæsthesia with ether was advised; in prophylaxis catharsis and chloride of iron.

[These cases illustrate the clinical distinction recently made by Meyer and others between the nephritis not uncommonly occurring just before labor, the "kidney of pregnancy" of the Germans, in which a favorable prognosis is justified, and chronic interstitial nephritis beginning after the fourth month and commonly resulting in persistent, incurable nephritis in the mother if she survives pregnancy, and, in a large number of cases, in intra-uterine foetal death from placental infarction.—ED.]

THE RELATION OF BACTERIA TO PUERPERAL ECLAMPSIA.

HOLMES (*Amer. Journ. of Obstet.*, August, 1889) considers bacteria, and ptomaines produced by them, the most frequent causes of nephritis and eclampsia in pregnancy. Bacteria may enter the body at the intestinal tract, circulate in the blood, cause capillary thrombosis in the kidneys, with nephritis, by the irritation of the ptomaines which they secrete. The urine from kidneys so affected is toxic, while normal urine is not.

CHLORAL BY STOMACH-TUBE IN ECLAMPSIA.

BLANC (*Arch. de Tocologie*, No. 7, 1889) reports four cases of eclampsia successfully treated by chloral, administered by a stomach-tube. The patients were comatose and deglutition was impossible; the rectum rejected fluids. Care should be taken that the solution be not too concentrated, to avoid vomiting; 1 : 30 or 40 of water is best. From 45 to 60 grains of chloral should be given at a dose; in twelve hours $2\frac{1}{2}$ drachms of chloral may be given, and the amount may be pushed to $4\frac{1}{2}$ drachms in twenty-four hours.

THE PROGNOSIS AND TREATMENT OF CONGENITAL UMBILICAL HERNIA.

LINDFORS (*Centralblatt für Gynäkologie*, No. 28, 1889) has collected 13 cases of congenital umbilical hernia, 10 of which were treated by laparotomy, freshening the edges of the hernial opening, and suture under antiseptic precautions. The remaining 3 were treated expectantly. The treatment by surgical procedure is the only one offering any chance of cure; of the 10 cases so treated, 7 made good recoveries, 3 died; 2 of these cases were operated upon under most unfavorable circumstances. Of the 3 cases treated expectantly, 2 died. Operative treatment may be instituted as early as the second day of life, with success.

A CONTRIBUTION TO THE STUDY OF THE FŒTAL KIDNEY.

NAGEL (*Archiv für Gynäkologie*, Band xxxv. Heft 1) concludes from the anatomical study of the foetal kidney that it becomes capable of secretion as early as the second month of pregnancy, when it gradually usurps the function of the Wolffian bodies. The foetal urine is voided into the amniotic liquid early in pregnancy, before the sphincter of the bladder is formed; after the third and fourth month the foetal bladder retains urine, voiding it at intervals into the amniotic fluid.

GYNECOLOGY.

UNDER THE CHARGE OF

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TUBERCULOSIS OF THE GENITALS.

WERTH's paper on this subject, read at the recent meeting of the German Gynecological Society (*Centralblatt für Gynäkologie*, July 20, 1889), considers only those cases in which surgical treatment is indicated—that is, those in which the tubes are affected. Two forms of tuberculous disease of the tubes should be distinguished, an acute and a chronic; in the former both the muscular and serous coats undergo cheesy degeneration, numerous bacilli being found in the interior of the tube, while in the latter the tubal wall undergoes hypertrophy and cell-infiltration, while its contents contain only a few bacilli. The increase in size of the tube, which may be considerable, is due to the collection of pus in its interior, as well as to the hypertrophy of the wall.

With regard to the treatment of this condition the writer does not agree with Hegar, who advises extirpation of the tuberculous tubes even when the peritoneum is affected; under these circumstances he simply evacuates the contents of the tube, which does not refill. In the discussion following the reading of the paper Elischer agreed with the reader that it was inadvisable to extirpate the tubes in cases of general tuberculosis. Hegar explained that he had been misunderstood as to two points. The reader had quoted him incorrectly as having stated that a tuberculous tube was thickened at its uterine end more frequently than was the case in any other form of salpingitis. He would, of course, not remove the tubes in cases of general tuberculosis, though he would not hesitate to do so when the disease was limited and the tubes were evidently the original foci; if the latter contained pus he would certainly remove them.

THE DIAGNOSIS OF INCIPIENT CANCER OF THE UTERUS.

FLAISCHLEN (*Deutsche med. Wochenschrift*, June 20, 1889) criticises severely a paper on this subject by Landau, in which the latter agrees with Spiegelberg's opinion, that "while in a clinical sense we may speak of beginning carcinoma (where the disease has not yet progressed far), microscopically we do not as yet recognize incipient cancer."

In opposition to this view stand the valuable observations of Ruge and Veit, supported as they are by numerous cases in which the development of malignant disease of the portio vaginalis was revealed by the microscopical examination of excised bits of the suspected tissue, long before palpation and inspection furnished evidence of the true condition. Landau admits that he, as well as other surgeons, knows of cases of removal of the uterus for beginning epithelioma of the cervix in which the condition was found to be simple erosion, and of other cases in which adenoma, or intra-uterine polypus was mistaken for corporeal epithelioma. His method of procedure in the case of

suspicious growths is not consistent with the opinion before expressed, the writer thinks, since he at once proceeds to excise the erosion.

[We do not see why Landau's paper should be dismissed by the writer as if it hardly deserved recognition, since the former's opinion with regard to the difficulty of making a positive diagnosis of commencing epithelioma is held by many competent observers. His practice of promptly excising a suspicious erosion we regard as eminently proper, as we have expressed in a recent paper on this same subject.—ED.]

EXTIRPATION OF THE UTERUS AND RESECTION OF THE VAGINA FOR PROLAPSUS.

ASCH (*Archiv. für Gyn.*, Bd. xxxv. Heft 2) recommends this radical operation for the cure of prolapsus, especially in the case of working women who desire permanent relief from the condition. Referring to the unsatisfactory results of plastic operations, he quotes the statistics of the Breslau clinic, which show that in only fifty-nine per cent. of the successful ones was the result permanent; other observers had reported but little better success. A patient cannot be called cured who is obliged to wear a pessary, or to have a subsequent operation. Alexander's operation and ventro-fixation are open to the same objection as plastic operations on the vagina and perineum—the liability to recurrence of the displacement from relaxation of the tissues.

In view of the comparative safety of vaginal hysterectomy and the permanence of the cure, this method of curing obstinate prolapse deserves careful consideration. The operation was first performed for this purpose by Gebhardt half a century ago, since which time the uterus has been extirpated seventeen times for complete procidentia (eight times at the Breslau clinic), excluding cases in which the displacement was complicated with cancer. The cases suitable for the radical operation are those of long standing in which the vagina has become so thickened that primary union cannot be expected in colporrhaphy, and those in which the uterus prolapses as soon as it is replaced and no pessary is retained. The patient being a working woman is unable to rest in bed or to have systematic massage with the view of reducing the size of the organ, or she may have had a recurrence after previous successful operations; she should have reached the menopause.

The steps of the operation are as follows: The patient being in the lithotomy position, a rubber cord is first placed about the mass which is to be removed, in order to control the hemorrhage. The cervix is then grasped with a volsella and drawn forcibly upward. Two incisions are made in the posterior vaginal wall at the junction of its upper and middle thirds, and are continued downward until they meet at an acute angle in the median line; Douglas's pouch is opened, and the peritoneum is united to the edge of the vaginal wound. A sponge having been introduced to prevent prolapse of the intestines, the uterus is retroverted and the broad ligaments are exposed and ligated in sections, the appendages being removed if possible. The uterus may easily be separated from the bladder by working from above (from the peritoneal side), the former organ being drawn upward to facilitate this. A triangular portion of the anterior vaginal wall is resected as before. If the bladder is adherent, the dissection may be carried freely into the tissue of the cervix, which is not possible in cases of cancer. Finally, the peritoneum is

sutured to the edge of the anterior vaginal wall, after replacing the bladder, and the stumps of the broad ligaments are united to the lateral edges of the vaginal wound. The opening into the peritoneal cavity is contracted by uniting the vaginal wound laterally.

No raw surface is left, except at the base of the bladder, which is within the peritoneal cavity, while the remains of the vagina are inverted and drawn upward by the traction of the stumps of the broad ligaments and the peritoneum; the latter force is an important one, since it counteracts the tendency to a recurrence of the prolapse.

The opening into the peritoneal cavity is plugged with a cone-shaped tampon of iodoform gauze; the after-treatment does not differ from that ordinarily adopted.

THE SUBSEQUENT RESULTS OF TOTAL EXTIRPATION OF THE UTERUS.

MÜNCHMEYER reported at the third German Gynecological Congress the

HOW FAR MAY A COW BE TUBERCULOUS BEFORE HER MILK BECOMES DANGEROUS AS AN ARTICLE OF FOOD?

BY HAROLD C. FRET, A.M., M.D.

OF BOSTON.

THE change of mil-

VENTRO-FIXATION OF THE UTERUS.

KÜSTNER (*Centralblatt für Gynäkologie*, August 10, 1889) makes a further contribution to the literature of this subject. He recommends this operation for the cure of adhesion of the retroflexed uterus only after Schultze's method of replacing the organ has been tried unsuccessfully. In order to prevent the reformation of adhesions he separates them with the Paquelin cautery, whereby the danger of hemorrhage is also lessened. He believes that after the uterus has been attached to the abdominal wall the patient is just as likely to abort if she becomes pregnant as she was when the organ was retroflexed and adherent, hence the operation is not advisable during the age of childbearing.

In the discussion which followed, FROMMEL took the ground that ventro-fixation merely substituted one pathological condition for another. He preferred to shorten and suture the utero-sacral ligaments to the posterior wall of the pelvis. The operation was facilitated by elevating the patient's hips as much as possible.

SÄNGER reported twelve cases of ventro-fixation, in five of which the adnexa were not removed. In one of the latter pregnancy subsequently occurred, and had progressed to the sixth month at the time of speaking; during the early weeks the patient complained of pains, as if from the stretching of adhesions. In no instance was there a recurrence of the displacement.

VEIT did not believe that ventro-fixation was ever necessary after removal of the tubes and ovaries, since the retroflexion then gave rise to but few symptoms.

PERINEORRHAPHY BY THE FLAP OPERATION.

SÄNGER read at the meeting of the German Gynecological Congress (*Centralblatt für Gynäkologie*, July 27, 1889) a paper on this subject, in which he stated that he had operated seventy-one times by the flap method, in ten cases for complete laceration of the perineum; in every instance the wound healed perfectly. Aside from the rapidity of the operation, the parts are restored by it to their original anatomical condition without the necessity of excising any cicatricial tissue. In a few cases it may be necessary to perform posterior colporrhaphy. The perineal body can be made as broad as is desired by extending the lateral incisions upward on the labia. The author is opposed to the use of the continuous catgut suture, and has also abandoned silk-worm-gut for silver wire, which gives the most perfect union. He is not yet sure that this method of perineorrhaphy is preferable to that of Freund, Emmet, and Simon and Hegar in cases of prolapsus without laceration of the perineum, although his own results have been entirely successful, which show that in only fifty-nine per cent. of the successful ones was the result permanent; other observers had reported but little better success. A patient cannot be called cured who is obliged to wear a pessary, or to have a subsequent operation. Alexander's operation and ventro-fixation are open to the same objection as plastic operations on the vagina and perineum—the liability to recurrence of the displacement from relaxation of the tissues.

In view of the comparative safety of vaginal hysterectomy and the permanence of the cure, this method of curing obstinate prolapse deserves careful consideration. The operation was first performed for this purpose by Gebhardt half a century ago, since which time the uterus has been extirpated, the tubal mucous membrane to the peritoneum by not (Breslau clinic) which the tube is returned to the cavity. The writer admits that this would be a hazardous procedure in cases of pyo-salpinx, but suggests that the distal end of the tube might be secured in the abdominal wound, so that the pus might escape externally, and that the adherent tube might be detached and restored to the cavity by a subsequent operation after the catarrh had been cured. The question might be raised whether the end of the tube, after it had been rendered patent, could not be sutured to the ovary (!).

[It must strike the reader that this is carrying conservative surgery rather too far.—ED.]

CORRIGENDUM.

IN Dr. Foote's paper on Germicides in our last issue, on page 245, both in the Table and on the last line of the page, for "thymol, 1 to 240" read "thymol, 1 to 2400."

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NOVEMBER, 1889.

HOW FAR MAY A COW BE TUBERCULOUS BEFORE HER MILK
BECOMES DANGEROUS AS AN ARTICLE OF FOOD?¹

BY HAROLD C. ERNST, A.M., M.D.,
OF BOSTON.

THE change of opinion in regard to the infectious nature of tuberculosis has been very marked in the last few years, not among the scientists, but among the people at large. Of course the medical world has, as a rule, accepted the conclusions to be drawn from Villemin's work of twenty-five years ago, and the discovery of the specific cause of the disease by Koch has only added strength to the theories advanced in certain quarters before that time.

The change of opinion spoken of is, after all, hardly a change, but, more properly, an acceptance of the knowledge gained in regard to the disease by the more recent and exact methods of research, and a much wider diffusion of that knowledge. More and more is it the rule that the knowledge of the transmissibility of tuberculosis by means of infected material is recognized among those whom it concerns the most, and nothing but good can come from the diffusion of that knowledge.

It is hardly too much to say that proper methods of management of tuberculosis, both in human beings and in animals, involve more important interests—pecuniary as well as vital—than any other subject that engages the attention of medical men. It is well known that one-seventh of the human race, approximately, perish from this disease, and when we acknowledge to ourselves, as a fair review of the evidence at

¹ Read before the Association of American Physicians, Washington, Sept. 20, 1889.
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hand must force us to do, that most, if not all, of this loss is preventable, our duty is plain before us. That is, never to cease speaking of it, never to give up trying to reconcile the money interests of man with his own welfare, and to do all in our power, by the collection of clinical and experimental evidence, to make the case complete.

The work showing the etiological relationship of the bacillus of tuberculosis to the disease was, to all intents and purposes, complete upon the publication of Koch's monograph upon the subject. Nothing more in the way of proof was actually needed, and, indeed, very little has been furnished. At the same time, confirmatory evidence was demanded by some who had and many who had not access to the original details, and this confirmatory evidence has been furnished in such overwhelming amount that it is to-day but a waste of time to repeat, what is accepted the scientific world over, that in the organism described by Koch we have the specific cause of this pathological change, and that without its activity we do not have tuberculosis in any form or under any conditions.

An imperfect understanding of the nature of bacteria in general, and of this organism in particular, has led to many attempts to arrest the pulmonary form of the disease it produces, by therapeutic measures, most of which would have been seen to be useless at the outset, if a knowledge of the problem had been complete. It is not upon drugs or mechanical means that our reliance should be placed in attempting to stamp out this scourge of civilized man. Our attention must be turned in the direction of proper preventive measures, and until the necessity for this is impressed upon physicians in general, and by them upon the people at large, so that the preventive measures suggested after mature deliberation will be complied with, but little can be effected, and the knowledge gathered after so much hard labor must be considered as wasted, for the time being.

In order to the suggestions upon which the stamping out of tuberculosis must depend, there is necessary a large amount of investigation into the methods by which it spreads and by which the virus is carried from person to person. Among these methods are undoubtedly the excreta—more especially the sputum—from persons affected with the disease; the excreta are carelessly treated and scattered broadcast to the injury of persons susceptible but not previously affected. The methods of distribution in this way, and the behaviour of the bacillus of tuberculosis outside of the body, have been well and recently treated by Cornet (*Zeit. f. Hyg.*, Bd. v. S. 191, 1888).

Other methods of distribution are of importance, however, and until within a few years have not received attention from the medical profession at all commensurate with their value. These methods of infection are those arising from the ingestion of food materials coming from the domestic animals, especially the flesh and milk of cattle.

In Koch's *Etiology of Tuberculosis* he uses the following expressions:

"Since by far the greatest number of cases of tuberculosis begin in the lungs, it is to be supposed that the infection in all these cases has taken place in the manner just suggested—by the inhalation of phthisic sputum dried and made into dust. The second principal source for the tubercle-bacilli, viz., tuberculosis of the domestic animals, appears not to have anything like the importance of the phthisic sputum. The animals, as is well known, produce no sputum, so that during their life no tubercle-bacilli get from them into the outer world by means of the respiratory passages. Also in the excrement of tuberculous animals the bacilli appear to be only exceptionally present. On the contrary, it is a fact that the milk of tuberculous animals can cause infection.

"With the exception of this one way, therefore (*i. e.*, through milk), the tuberculous virus can only have effect after the death of the animal, and can only cause infection by the eating of the meat. The same conditions hold for the milk of cows suffering from 'perlsucht.' Before all things, if infection is to take place, it is necessary that the milk contain tubercle-bacilli; but this appears to be the case only when the milk-glands themselves are affected with the disease. This explains at once the contradictions in the statements of various authors, who have made feeding experiments with the milk from cows suffering from 'perlsucht.' If infection from tuberculous animals does not appear to be frequent, it must by no means be underrated."

This caution is one which was necessary at the time it was written, and its repetition is as necessary now as ever. What conclusions may be reached in regard to its *extreme* importance, are well shown by the statistics collected and presented by Dr. Brush before the New York Academy of Medicine, on April 29, 1889 (*Boston Med. and Surg. Journal*, cxx. p. 467 *et seq.*). In this paper the author states that after several years of close study of the affection, including a consideration of all accessible statistics, and the habits of the people among whom it prevails, he has arrived at the conclusion that the only constantly associated factor is found in the in-bred bovine species. If a community was closely connected with in-bred dairy cattle, tuberculosis prevailed, and, *vice versa*, if there were no in-bred dairy cattle there was no tuberculosis. In the discussion following this paper many objections were raised. Dr. Brush went on to say that he believed that the disease was originally derived from the bovine species. He did not believe that less than fifty per cent of all dairy cattle were affected with it, while the statistics he had quoted showed that wherever there was a race of people without cattle phthisis was unknown. He believed, furthermore, that if all the cattle in this country were to be killed, the disease would finally die out entirely here.

Such statements as these are a revelation to the generality of practitioners, and may seem to be somewhat forced, but they certainly indicate, together with the statistics upon which they are based, the existence of a greater danger than has been fairly realized. That the danger from the consumption of milk coming from cows affected with tuberculosis has been understood by individuals at least, and that, too, before the announcement of Koch's discovery, is very well shown by extracts from

a letter which I take the liberty of quoting here. The gentleman writing it is a veterinarian in practice in Providence, R. I., and the observations were made and the advice given more than ten years ago. That portion of his letter bearing upon the subject in hand is as follows :

"Mr. W., June 15, 1878, called me to see a white and red cow. Coughs and is short of breath and wheezes. Pulse 60; respiration 14, and heavy at the flanks; temperature 104°. Diminished resonance of right lung, but increased in part of the same. Emphysematous crackling over left lung and dulness on percussion. Diagnosed a case of tuberculosis and advised the destruction of the animal.

"Dec. 12. Cow in a cold rain a few days ago for about two hours. Milk still more diminished than at a visit made on September 25th. Again advised the destruction of the cow. Family still using the milk. Respiration 20; pulse 85; temperature 104.6°.

"Feb. 22, 1879. Temperature 104.8°; respiration 26; pulse 68. Losing flesh fast. Milk still in small quantities. Advised, as before, to destroy the animal and *not to use milk*.

"May 30. Called in a hurry to see cow. Is now as poor as could be. No milk for a week. Pulse 80; respiration 40; temperature 106°. The cow died in about three hours. Autopsy made fourteen hours after death: Lungs infiltrated with tuberculous deposit. Weight of thoracic viscera 43.5 pounds. Tuberculous deposits found in the mediastinum, in the muscular tissues, and in the mesentery, spleen, kidneys, udder, intestines, pleura, and one deposit on the tongue. The inside of the trachea was covered with small tubercles.

"In August, 1879, the baby was taken sick, and died in about seven weeks. On post-mortem of the child there was found meningeal tuberculosis—deposits all over the coverings of the brain and some in the lung.

"In 1881 a child, about three years old, died with, as it was called, tuberculous bronchitis. And in 1886, a boy, nine years old, who for three or four years had been delicate, died with consumption—'quick,' as it was called.

"So far as known, the family on both sides have never before had any trouble of the kind, and the parents were both rugged and healthy people, and so were the grandparents—one now being alive and sixty-eight years old, and the other dead at seventy-eight."

Of course there is much room for criticism, if these cases be quoted as carrying out an exact clinical experiment, and no one can say that the occurrence of the three deaths in the same family was anything more than a coincidence. At the same time it must be acknowledged that they offer very solid suggestions for consideration, and that the light thrown upon the disease by the investigations of recent years make the advice of the veterinarian to "kill the cow and stop using the milk" much more sound than it appeared to the minds of the medical gentlemen who "laughed" at him at the time it was given.

It is my hope within the coming year to collect a series of clinical observations which will be of interest and some service in elucidating the question of how many cases of tuberculosis occur which produce suspicion in the minds of medical or veterinary attendants of having an origin in the milk from infectious cows.

It is upon this question of possible danger from the domestic animals

—especially cattle—that much recent work has been done, but the subject has been by no means exhausted.

If there is danger to human beings from the widespread existence of tuberculosis among cattle, some sort of restrictive measures must be taken, by means of which this danger can be lessened. At the same time legislation calling for so much pecuniary loss as would be the case if the present supply of tuberculous cattle were to be destroyed, can only be asked for with a backing of as much carefully gathered scientific evidence as can be obtained, and it is the part of preventive medicine and the experimental method to furnish some of this evidence.

Through the liberality and broad-mindedness of an association of gentlemen in Boston, it is possible to present the results of certain experiments undertaken to determine the question which is expressed in the title of this paper. "How far may a cow be tuberculous before her milk becomes dangerous as an article of food?" is an extremely important point to decide. If it be considered already settled and Koch's dictum be accepted, that there is no danger in the milk, if the mammary glands be not affected, then there remains only for the veterinary surgeon to determine the existence of such lesions, and restrictive measures can go no further. If, however, the milk from cows with no visible lesion of the lacteal tract be shown to contain the specific virus of the disease in a not inconsiderable number of cases, and if this milk be shown to possess the power of producing the tuberculous process upon inoculation in small quantities and in feeding experiments carried out with every possible precaution, then restrictive measures must have a far wider scope, and be carried on from an entirely different standpoint than has heretofore been considered necessary.

It is familiar to most of us that little importance has been attached to this question—the danger of milk from tuberculous cows with no lesions of the udder—for the reason that many experiments have been made with negative results, and because *à priori* reasoning would seem to indicate the absence of such danger; because tuberculosis is not a disease like anthrax, in which the specific poison is to be found in all parts of the system and is carried from one place to another by the blood-stream. Koch's assertion that the milk from cows affected with tuberculosis is dangerous only when the udder is involved, appears to be based upon theoretical considerations rather than practical work in this especial direction. It has been widely accepted, however, and the weight of his name has caused the assertion to be repeated many times with but few attempts to verify its correctness.

The increased attention that has been paid to the disease among cattle, and the suspicions that have been aroused that tuberculosis among the domestic animals is a more frequent cause of its appearance among men than has been supposed, have made a careful investigation

of this point imperatively necessary. With the exception of a few successful experiments by Bollinger (*Deutsch. Zeit. f. Thiermed.*, Bd. xiv. S. 264) and Bang (*Ibid.*, Bd. 11, S. 45, 1885), no evidence of great value is to be adduced. These authors, as well as Tschokke (quoted by Bollinger), bring out isolated cases showing successful inoculation experiments with the milk from tuberculous cows with no disease of the udders, but the experiments are so few in number that they cannot be accepted as furnishing more than a probability, and extremely critical persons might be justified in ascribing the results to contamination.

Bang (*Congrès pour l'étude de la Tuberculose*, 1, p. 70, 1888) gives new results. Examining twenty-one cases of cows affected with general tuberculosis but with no signs of disease in the udder, he found but two whose milk showed virulent qualities upon inoculation in rabbits. He concludes that since the cows experimented with were in advanced stages of the disease and yet showed such slight virulent properties in their milk, the danger from cows in less advanced stages is much less. And this conclusion he thinks is borne out by experiments with milk drawn from eight women affected with tuberculosis; specimens were used from all for inoculation and none were found to be virulent. He draws the conclusion, therefore, that it is not necessary to consider all milk dangerous coming from tuberculous cows, but that it should always be *suspected*, because no one can say when the udder will be diseased, and because, without this, the milk from tuberculous cows contains the virus in rare cases.

I shall endeavor to show that it is not at all rare for such milk to contain the virus.

Galtier also (*loc. cit.*, p. 81) has given the result of certain experiments with milk coming from tuberculous cows, but he says that

"certain experimenters claim to have established the virulence of milk coming from animals whose udders appeared to be normal and free from any lesions; the greater number, and I am one of them, have merely encountered a virulence in milk after the udder had become tuberculous. However, as a beginning tuberculosis of the udder is an extremely difficult thing to recognize, especially during the life of the animal, the milk should be considered dangerous which comes from any animal affected, or suspected of being affected, with tuberculosis."

I shall endeavor to show that this view of the case is justified by something more than probabilities.

In the *Deutsch. Arch. für klin. Med.*, Bd. xlv. S. 500, Hirschberger reports the results of an experimental research upon the infectiousness of the milk of tuberculous cows, in which—following out Bollinger's work—he attempts to settle, 1st, whether the cases are rare in which tuberculous cows give an infectious milk; and 2d, whether the milk is infectious only in cows with general tuberculosis, or whether it is also infectious when the disease is localized. He made the trials of the in-

fected milk by injection into the abdominal cavity of guinea-pigs with the usual precautions. His results were as follows:

1. Milk was used five times from cows affected with a very high degree of general tuberculosis in all the organs.

2. Milk was used six times from cows with only a moderate degree of disease.

3. Milk was used nine times from cows in which the disease was localized in the lung.

From these twenty cases the milk was proven to be infectious in eleven. The percentage of positive results in the animals when arranged in accordance with the three groups above given was 80 per cent. in the first group (milk from cows in a very advanced stage of the disease), 66 per cent. in the second group, and 33 per cent. in the third. He found the bacilli in only one of the specimens of the milk, and considers that this, therefore, shows that the inoculation experiments are the more certain guide as to whether the milk is infectious or not.

These results are extremely interesting, although they do not lay as much stress as do mine upon the presence or absence of lesions of the lacteal tract.

The experiments which I am able to report¹ have been made possible by the liberality of the Massachusetts Society for the Promotion of Agriculture, which became interested in the question some time ago, and has put it in my power to carry them on. They have given everything in the way of pecuniary and moral support that the work has required; my own part has been that of general director, and I have had associated with me during the whole time the Society's veterinarian, Austin Peters, D. V. S. For the last year I have also had the very valuable aid of Dr. Henry Jackson and Langdon Frothingham, M. D. V.

All of the inoculation experiments and most of the microscopic work have been done in the bacteriological laboratory of the Harvard Medical School, some of the microscopic work at the Society's laboratory in Boston, whilst the feeding experiments have been done and the experimental animals have been kept at a farm in the country devoted to this especial purpose, and situated among the healthiest possible surroundings. Nothing has been set down as the result of microscopic observation that I have not myself verified, and every portion of the work has been carried out under the most exacting conditions and with every possible precaution against contamination.

Before the farm buildings were used at all they were thoroughly cleaned from top to bottom. Every portion of old manure was carted away, as well as all the old earth. The whole of the woodwork was

¹ The full notes of these experiments will be found in the Transactions of the Association of American Physicians, vol. iv., 1889.

scrubbed and then washed with corrosive sublimate solution (1:1000) and finally whitewashed, and every care was taken to secure good drainage and free ventilation. The result and effectiveness of all this have been best demonstrated by the fact that every animal brought to the place made a most marked improvement in its general condition, while some of them even went so far as to appear to get well.

In deciding whether the milk from any cow affected with tuberculosis is dangerous, when the udder shows no lesion, the first point is to see whether the milk contains the infectious principle or not. In this case, of course, that infectious principle is the bacillus of tuberculosis, and attention was turned to that for some time. The observations have been carried on over a long space of time, and were made as follows: The milk was taken from the cow in the morning—or evening, as the case might be—the udders and teats having just been thoroughly cleansed. The receptacle was an Erlenmeyer flask, stoppered with cotton-wool and thoroughly sterilized by heat. The specimen was taken at once to the laboratory, there placed in conical glasses, with ground-glass covers—the whole of these having been carefully cleansed beforehand—and then allowed to stand in a clean refrigerator for twenty-four to forty-eight hours, and sometimes for seventy-two hours.

At the end of that time from ten to twenty cover-glass preparations were made from various parts of the milk or cream. These were stained after Ehrlich's twenty-four hour method, with fuchsin and methylene blue as a contrast color, and then searched with an immersion lens.

We prepared for examination in the way spoken of above, one hundred and seventeen sets of cover-glasses from as many different samples of milk. Of these specimens three spoiled, *i. e.*, turned sour or acid before the examination was completed, and must be rejected, leaving, therefore, one hundred and fourteen samples of milk of which the examination was completed. These samples were obtained from thirty-six different cows, all of them presenting more or less distinct signs of tuberculosis of the lungs or elsewhere, but none of them having marked signs of disease of the udder of any kind.

Of these samples of milk there were found *seventeen* in which the bacilli of tuberculosis were distinctly present; that is to say, the *actual virus was seen in* 31.5 per cent. of the samples examined (36:114 = 31.5). These seventeen samples of infectious milk came from ten different cows, showing a percentage of *detected* infectiousness of 27.7 per cent. (10:36 = 27.7). These results are exceedingly interesting, it seems to me, and I confess I am surprised at the size of the percentage named. Not because I had not expected to find the bacilli—I have been convinced for several years that persistent search would show their presence in such cases as those that are here recorded—but because the amount of dilution to which the organisms must be subjected dimin-

ished immensely the chance of their being found at all. In no case have they been seen in large numbers, but equally in no case has a diagnosis been made where there was the slightest doubt of the appearances under the microscope.

The large number of cases in which these organisms have been found seem to me to indicate their presence in a still greater proportion of cases, if only a sufficiently thorough examination of all the milk could be made. This of course is out of the question, but the results here given seem to establish, beyond a doubt, the fact that milk coming from cows with no definite lesion of the udder may contain the infectious principle of tuberculosis, if the disease be present in other portions of the body of the animal. Also, that this presence of the infectious principle is not merely a scientific *possibility* but an actual *probability*, which we should be thoroughly aware of and alive to.

Other interesting facts shown are these: that the cream after rising is quite as likely to be infectious as the milk, because the bacilli were found in the milk nine times after the cream had risen, and in the cream eight times after it had separated from the milk.

In regard to the constancy of the occurrence of the bacilli in the milk, in two of the ten cows in whose milk the bacilli were found, but one sample of the milk was examined; and the bacilli were found in one sample out of several examined at different times, in two cases. In the remaining six cows, bacilli were found two or more times in different samples of the milk. So that, as far as they go, these results seem to indicate that the bacilli are present with a fair degree of constancy. At the same time it should not be surprising if one examination was successful and others failed, because of the chances against success, owing to dilution, which were spoken of above.

In nine of the seventeen cases the time of the milking and the portion of the milk used were noted; that is to say, a sample was taken from the first of the milking, or the last of the milking, and then cover-glasses made from the milk or cream. In these cases bacilli were found in the cream three times, and in the milk four times, from the first of the milking; in samples from the last of the milking, in the cream no times, and in the milk four times; and this too seems to show an interesting point, viz., that the bacilli, if present at all in the udder, are not washed out entirely by the first manipulations of the teats, but may be supposedly present in any portion of the milk. The converse is also indicated, that the manipulation of the udder in the process of milking does not express the bacilli from the tissue into the latter portion of the milk, but that, as before, they may be supposed to be pretty evenly distributed in all parts of the udder if they be present at all.

Before going on to consider the results of the inoculation experiments made with various specimens of milk, it may be well to glance at the

condition of the cows that have been under our control from the time of the beginning of the experiments until they were killed, or until the date of preparing this paper.

The history of each cow, as far as we have been able to secure it, bears out our assertion—as far as the examinations have gone, that none of the udders were affected with tuberculosis—certainly so far as gross appearances were concerned. This was true, also, in the microscopic appearance of every case but one (No. 6, cow F). In this case the gross appearances in the udder were healthy, except that one quarter seemed to be slightly fibrous, and there were one or two yellow spots which were seen to be made up of fat under the microscope. With a low power lens only a slight increase of fibrous tissue was observable, and the oil-immersion was put on merely as a matter of routine. One giant cell was discovered containing a number of bacilli, but a careful search failed to show any others, or any signs of change, except the increase of fibrous tissue noted above. So that the assertion is still true, that we have failed to discover any signs of tuberculosis that were easily recognizable in any of the cows here recorded, and these include all we have had under closer observation.

Those from which milk was used for inoculations that are not here given had no signs that permitted of even a probable diagnosis by skilled veterinarians.

We also made an interesting series of experimental inoculations in rabbits and guinea-pigs with milk or cream from various cows, in varying quantities and at different times. Of rabbits there were used fifty-seven animals. Of these, five were inoculated with milk which had turned sour, two died of intercurrent diseases in a few days (*coccidium ovi-forme*), and of one the material was lost before the microscopic examination was completed—so that eight animals are to be rejected, leaving forty-nine upon which the results can be based. Out of these, five were made more or less tuberculous, as proven by microscopic examination, and in forty-four the results were negative—that is to say, we obtained 5 : 49, or 10.2 per cent. of successes out of all inoculations in rabbits.

There were used thirty-three different specimens from thirteen different cows—that is, there were 23 per cent. (3 : 13) successful results from the cows used, and 15.15 per cent. (5 : 33) successful results from the specimens used.

Positive results were obtained from

Cow P twice (at different times).

Cow L once.

Saunders cow twice (at different times).

The results of the inoculations of guinea-pigs are more striking. There were sixty-five animals used in all. Of these, nine were inoculated with sour milk or cream, and two died in a day or two of other diseases (peri-

tonitis and pleurisy). There are, therefore, but fifty-four that should be counted. In them, there were twelve positive results, or 28.57 per cent. (12:42) successes out of all the inoculations. There were used thirty-two specimens from fourteen different cows, and the successful results came from six different cows—that is, 42.8 per cent. (6:14) of the cows were shown in this way to have infectious milk, and 37.5 per cent. (12:32) of the specimens used were shown to have active infectious properties.

Positive results were obtained from

Cow P (three times in two different inoculations).

Cow D (three times in three different inoculations).

Cow F (once).

Slocum cow (once).

Saunders cow (once).

Mayhew cow (three times in two different inoculations).

The combining of the results obtained from both rabbits and guinea-pigs shows the following: Successful results were obtained in milk from cow P three times (two different specimens) in guinea-pigs, and twice in rabbits (two different specimens); from cow L once in rabbits; from cow O three times (three different specimens) in guinea-pigs; from cow F once in guinea-pigs; from the Slocum cow once in guinea-pigs; from the Saunders cow once in guinea-pigs, and twice in rabbits (two different specimens); and from the Mayhew cow three times in guinea-pigs (two different specimens)—that is to say, out of fourteen cows used the milk was shown to be infectious in seven, or 50 per cent., by inoculation experiments.

An interesting fact is also shown, and that is, that bacilli were found in the milk or cream, and successful inoculation experiments made in animals with the same specimen in five different cases (including eight of the successful ones) as follows:

Comparison of the dates when Bacilli were found in the Milk and the same Milk was used for successful inoculation experiments.

Cow.	Positive. Cover-glass.	Positive. Guinea-pig.	Positive. Rabbit.
P.	Cream, A. M.	Cream, A. M., March 9, 1889	Cream, A. M., March 9, 1889
	Cream, P. M.	j Cream, P. M., March 9, 1889 i Cream, P. M., March 9, 1889	Cream, P. M., March 9, 1889
O.	First of milking, cream, March 9, 1889.	First of milking, cream, March 9, 1889	
Slocum.	Last of milking.	Last of milking, June 10, 1889	
Mayhew.	Last of milking, milk.	Last of milking, milk, June 21, 1889	

The inoculation experiments, above detailed, seem to me to be deserving of consideration because they were done under the most careful precautions that could be devised. In all cases the experiment animals were kept under observation long enough to determine, so far as could

be seen, that they were in good health, and after the inoculations they were separated and kept under close watch, but in healthy surroundings. Some of those that were used were inoculated immediately after purchase, because of a scarcity of the supply at the farm, and were not in good condition. But as no sign of tuberculosis appeared in any of these, their ill health cannot come in as a disturbing factor in the results.

The results obtained from certain feeding experiments with calves show that there were thirteen calves used, and fed for varying lengths of time with milk from cows affected with tuberculosis, but not of the udder. Of these, the material was thrown away from one before the microscopic examination, and this should be rejected in the final results. Of the remainder there were five positive results obtained and one suspicious. The latter is counted as negative, for the reason that, although giant cells and granulation tissue were seen, no bacilli were found. There were, therefore, five out of twelve positive results, or 41.66 per cent. It should also be said that of those counted as negative three sets of specimens were suspicious, but were hastily examined for the purposes of this paper, so that a more careful search may very probably increase the percentage of successes.

In the series of feeding experiments on one set of pigs, the milk being given to them from the same cows as before, there were seven pigs used in all, from one litter and healthy parents. Of these, examination showed negative results in two, positive results in two, one was subjected to a very hasty microscopic examination, and the material from two was thrown away—a mistake, as was shown by the results of the microscopic examination of the material from No. 3. There are to be counted, therefore, only five, giving as successful results 40 per cent.

By the cover-glass examinations we have shown that the milk contains infectious material in ten cows out of thirty-five from which the milk was examined for bacilli—that is, in 28.57 per cent. We have also shown that the milk was infectious, by inoculation experiments, in seven out of fourteen of the cows from which the milk came—that is, 50 per cent. And we have shown the infectious nature of the milk by ocular demonstration and successful inoculation from the same specimens in five cows out of fourteen used—or, 35.7 per cent.

These results are, to a certain extent, preliminary—that is to say, they are but part of the work upon this subject which is being done under the auspices of the Massachusetts Society for the Promotion of Agriculture. The work will not be completed, at any rate, until next year.

They show, however:

- 1st, and emphatically, that the milk from cows affected with tuberculosis in any part of the body may contain the virus of the disease.

2d. That the virus is present whether there is disease of the udder or not.

3d. That there is no ground for the assertion that there must be a lesion of the udder before the milk can contain the infection of tuberculosis.

4th. That, on the contrary, the bacilli of tuberculosis are present and active in a very large proportion of cases in the milk of cows affected with tuberculosis but with no discoverable lesion of the udder.

THE TREATMENT OF PHTHISIS PULMONALIS WITH SMALL DOSES OF MERCURY BICHLORIDE COMBINED WITH POTASSIUM IODIDE.

BY JOHN R. HALL, M.D.,
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IN THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES for January, 1876, may be found an article from the pen of Prof. Edward L. Keyes, of New York, giving the results of his experiments showing the effect of small doses of mercury in modifying the number of red blood-corpuscles in syphilis. In these experiments the hæmatimeter of Hayem and Nachet was used, and "every possible source of error eliminated."

As the result of these experiments, Prof. Keyes deduced the following conclusions:

First. Five million red blood-corpuscles in the cubic millimetre, is a full high average for the adult healthy male; fine conditions of physical health reach above six millions.

Second. Mercury decreases the number of red blood-corpuscles when given in excess.

Third. Syphilis diminishes the number of red blood-corpuscles below the healthy standard.

Fourth. Mercury in small doses, continued for a short or long period in syphilis, alone or with the iodide of potassium, increases the number of red corpuscles in the blood and maintains a high standard of the same.

Fifth. Mercury in small doses acts as a tonic on healthy animals, increasing their weight. In large doses it is debilitating or fatal.

Sixth. Mercury in small doses is a tonic for a time at least, to individuals in fair health, not syphilitic. In such individuals it increases the number of red blood-corpuscles.

These conclusions deeply impressed me at the time of their publication. I often reasoned upon the probable value of this drug in other forms of disease characterized by cachexia, emaciation, diminution, or destruction of red corpuscles, fibrous infiltrations, etc. About eight years after reading Prof. Keyes' article I first administered small doses of bichloride of mercury with potassium iodide to patients suffering from

phthisis, with a result which, compared with former experience in such cases, was no less surprising than gratifying. During the succeeding years I have witnessed a repetition of its action sufficiently often to convince me of its great value in treating this formidable disease, which annually destroys so many of the lives of human beings and of the lower animals.

The following cases represent a part of my experience only. Their histories are necessarily incomplete, scattered as they are over several years, no records of the cases being kept. A few dates from my ledger are the only recorded facts, and even these are in some instances absent, the poverty of the patients forbidding a charge. The important facts involved are not the less valuable because of these imperfections. The following conditions were present (in different degrees of course) in all the patients, viz.: A frequent pulse, elevated temperature, a wasted or wasting body, loss of appetite, cough, often accompanied by bloody expectoration, pulmonary dulness on percussion, increased vocal resonance, prolonged expiratory murmur, moist râles, etc.; in short, those factors were present the *tout ensemble* of which constitutes consumption. The mercury was given in doses ranging from the thirty-second to the sixteenth of a grain; the potassium iodide in from two- to five-grain doses.

CASE I.—On March 18, 1884, I was called to see J. A., aged sixteen years, whose parents informed me that for some time he had been in failing health with cough. The family history was bad, several maternal uncles having died of acute phthisis. His condition was at once seen to be very serious—pulse rapid, fever high, profuse sweating, body weight much reduced, solidified lung, and the other physical signs denoting a rapid destruction of its function and its substance.

Prescribed *veratrum viride* to control heart's action, and put him on bichloride of mercury and potassium iodide three times a day. Improvement was perceptible within a few weeks; the parents were instructed to continue the medicine for a year or more. I occasionally saw this patient until September of the same year, when he appeared to be in almost robust health, having reached that condition by slow and steady progress. His parents considered him entirely well and discontinued the remedy. I was again called to see him on April 30, 1885; found the disease had redeveloped during the latter part of the winter, and had, in fact, produced a hopeless condition, from which he soon died.

CASE II.—William H., adult, was seen March 4, 1885. There had been a steady decline in health for weeks; his left lung was solidified almost throughout its entire extent, bronchial respiration, moist râles, temperature of 103° , pulse 125; great emaciation, night-sweats, cough with bloody expectoration; gave *veratrum viride*, applied a blister, and prescribed bichloride of mercury and potassium iodide, which he began taking in a few days. Improvement was slow but uninterrupted when once established; the remedy was continued for one year, during which time his lung returned to a nearly normal condition, his weight being seventeen pounds greater than ever before. Afterward this patient became dissipated, careless, went poorly clad, and was necessarily and unnecessarily

much exposed. During the latter part of the summer of 1888 he was overtaken by a rain-storm; from this exposure the disease was rekindled. He died in the care of another physician on the 30th of March, 1889, having lived three years of comparative health and usefulness from the time of the first attack.

CASE III.—Annie A., was seen in consultation. Family history of phthisis, from which disease she was suffering in its acute variety; fever, quick pulse, pulmonary consolidation, etc. The bichloride of mercury and potassium iodide were given, combined with fluid extract of *phytolacca*; convalescence was established in due time and maintained until perfect health was restored, and yet remains.

CASE IV.—Miss Mary B., just entering into womanhood; a maternal aunt died of phthisis. There were present in this case cough, very rapid pulse, loss of appetite and slight loss of flesh, percussion dulness at apex of right lung, disturbed sleep, menstrual period irregular. Other physicians examined this patient—considered her the victim of incipient phthisis; several months' treatment as above set on foot a recovery which a winter spent in Western Texas made perfect.

CASE V.—Mrs. W., about fifty years of age. History of consumption in her family; slight consolidation of left lung, temperature constantly above normal, pulse rapid, appetite poor, emaciation, hypertrophy and induration of liver and spleen. Prescribed arterial sedatives, and bichloride of mercury with potassium iodide; these remedies were continued for months with marked benefit. The following winter was spent in the mountains of West Virginia. The remedy being kept up, she returned to Missouri the following spring, and for two years which have since elapsed remains quite well.

CASE VI.—Henry F. (colored), aged fifteen years, member of a scrofulous family, brought to my office in the spring of 1885; condition was—solidified lung, exceedingly rapid pulse, temperature 103° , cough, etc., which warranted the gloomiest prognosis; it was difficult to believe that he could survive for six weeks, so worn was he and so extensive and formidable were the disease processes. Prescribed *veratrum viride*, bichloride of mercury, and potassium iodide. The change within eight or ten weeks was marvellous, local and general. Later in the summer, I met this patient riding horseback; he was fat, the ashy skin so indicative of ill-health in his race, having given way to an oily, shiny appearance of that great emunctory. Unfortunately this boy got so well that, in violation of instructions, all medicine was discontinued. While hunting the following winter the rebound of his gun fractured the nasal bones, suppuration and caries followed, his lung affection returned. I saw him the next spring; a resumption of the remedies failed to relieve him and he soon perished.

CASE VII.—Miss Mamie H., aged twenty years, consulted me on October 20, 1888. Father's family tuberculous; herself in second stage of phthisis. There was a cavity in apex of right lung, she suffered from frequent chills and almost constant fever; she had rapid pulse, distressing cough, profuse night-sweats, pleuritic pains, and occasionally diarrhœa; her appetite was gone, and that part of her body not entering into the composition of skin and bones rapidly going. She was given *veratrum viride* with bichloride of mercury and potassium iodide. There was some amelioration of her symptoms within three or four weeks, after which improvement was steady. In April, 1889, her condition was: No

fever, absence of chills and night-sweats, cough greatly diminished, unmistakable improvement in lung, and return of menstruation, twenty-four months absent. Miss H. weighed in December, after convalescence had begun, one hundred and thirteen pounds with cloak and overshoes on; in March, 1889, her weight was one hundred and nineteen and a half without those articles.

CASE VIII.—Mrs. M., a young married woman, mother of three children, youngest born in January, 1889. Two weeks after delivery pneumonia developed, ran an ordinary course, resolution was imperfect; after being able to go into the yard, which she did, and from which she contracted a cold, her cough increased and fever returned. I saw her when this condition had existed for several days. The lung was again solid, pulse rapid, temperature $103\frac{1}{4}^{\circ}$, soon after she was attacked with phlegmasia alba dolens of right leg, and within a few days the same state of affairs developed in the left, the lymphatics of the groins were enlarged and painful, her expectoration was bloody and contained lung fibre. This patient was given antifebrin and quinine, veratrum viride, bichloride of mercury, and potassium iodide.

It is now about three months since she has been bed-ridden with this combination of ills; for a time it appeared that she was a victim of general tuberculosis. The pulmonary condition was one of cheesy infiltration, the result of catarrhal pneumonia, from which, Niemeyer says, "patients usually die in a few weeks consumed by fever." That author gives this as one of the forms of phthisis pulmonalis. I visited Mrs. M. last on the third of May; found her sitting up rocking to sleep her babe; pulse 75; temperature $98\frac{1}{2}^{\circ}$; appetite good and had been for weeks. The lung is yet far from sound, slightly dull on percussion, and very feeble respiratory murmur. This patient had two maternal aunts to die with phthisis. I shall insist upon her continuing the mercury and potassium iodide for twelve or eighteen months.

CASE IX.—Master G., four years old, of phthisical family, is recovering from a very similar attack, of three months' duration.

It is not claimed for this remedy that it is a specific; it has failed in the writer's hands in aged patients, and notably in a case of intestinal tuberculosis, although guarded in this case by opium.

On the other hand, I am certain that it has arrested the disease in its incipency in persons to whom it has been administered, who were members of families which I had seen almost decimated by acute tuberculosis. Cases of this variety are excluded from this paper for the reason that, although the other symptoms of phthisis were present, the pulmonary condition was equivocal.

Since beginning the preparation of this paper I have searched all the medical literature within reach for the history of any use of the mercuric chloride in phthisis. Only one reference has been found. In a paper read May 22, 1888, Dr. Nelson L. North, of Brooklyn, mentions a number of drugs that have been beneficial in consumption; among the others, he says, "the chlorides of mercury, especially the bichloride,

have, I believe, been the means of doing much good." THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES for December, 1888, says :

"Dr. A. Dochmann, after reviewing the literature pertaining to the employment of mercury in phthisis, says, that in his experience calomel has a rapidly favorable action in ordinary forms of anæmia, even in cases in which iron has been without effect. It increases the appetite, removes constipation, and regulates menstruation long delayed. Then there is an anæmia the result of an already existing phthisical dyscrasia. As is well known, iron in these cases is entirely without benefit, and even sometimes injures by disturbing digestion.

"Pulmonary affections, so slight as to be overlooked, often present such symptoms with disturbance of nutrition. As the disease advances slight fever appears, with slight dry or mucous cough, and, finally, objective symptoms become evident. In such cases treatment with calomel for two or three months is followed by the best results, appetite increases, cough and fever diminish, or even disappear, and the night-sweats cease. It prevents decomposition in the intestinal tract, and does not interfere with the digestive ferments." The Editor adds: "G. Martell has for three years been using calomel in tuberculous processes, and has accorded to it the first position as a specific antiseptic. He has had the most favorable results from it in tubercular disease."

The preparations of mercury have long stood without a rival in the treatment of syphilis affecting any portion of the body. Wherein does the pathology of a syphilitic lung differ from a phthisical lung? To appreciate more clearly what this difference is, or is not, it is necessary to quote the words of some of those who are entitled to a hearing on this subject. Dr. Thomas J. Mays, Professor of Diseases of the Chest at the Philadelphia Polyclinic, in a lecture delivered January 28, 1889, on syphilitic phthisis, reviews the fifty-eight post-mortems of Hiller, and says :

"From these data it may be observed that syphilitic phthisis does not differ materially in its anatomical aspects from the non-specific, or ordinary, variety."

Walshe, on this subject, says :

"There seems to be nothing distinctive in the anatomical characters of the syphilitic variety of the product, and the connection between the low quasi-inflammatory process producing it, and syphilis, is only to be established by the antecedents of the individual and the coexisting positive results of tertiary syphilis."

Wilson Fox, in Reynolds's *System of Medicine*, says upon this point :

"Syphilitic growths in the lungs certainly bear a closer resemblance to tuberculous formations than is presented by almost any other morbid change in this organ;" and further remarks, "I would not, without much further personal experience than I possess on this subject, venture to affirm that syphilitic changes in the lung are identical with tubercle; but it is impossible to study the observations of those who have investigated both processes, and particularly the researches of Virchow, without being convinced of the close analogy between them."

From this striking likeness of the two diseases, it is certainly rational to expect much of that remedy in the one which is the sheet-anchor of hope in the other.

Upon the curability of phthisis, I desire to quote Dr. Aufrecht, Chief Physician at the City Hospital of Magdeburg. In four discourses delivered before the medical society of that city, he says :

"Since the discovery of the tubercle bacillus, the tendency has been to consider the medical treatment of this grave disorder as little better than fruitless, until some certain specific is found against the parasite."

From this opinion or tendency he positively dissents, and maintains that "it is folly to remain inactive awaiting such discovery."

"After a careful study of the investigations of Koch, he does not believe in the causal relation of the bacillus tuberculosis to phthisis, which, if true, would imperatively demand the isolation of the sick. He maintains that the only possible therapeutics of phthisis must be based on clinical experience.

"In his opinion, under continued medical care, supported by dietetic and therapeutic means, especially if applied at a very early stage of the disease, pulmonary consumption, or, more precisely speaking, the lung diseases leading thereto, afford a better prognosis than other chronic diseases."

That the bichloride of mercury acts in phthisis primarily through the nutritive processes, appears most probable. Dr. George Cornet, of Berlin, experimented with eight germicides, including bichloride of mercury, to determine their action upon animals inoculated with tubercle; not one of which could be proven to have influenced the progress of the disease, *although all* were given in *maximal* doses, and adds: "Indeed, many of the animals died from the effects of the drug, or showed marked symptoms of poisoning." Dr. Cornet further says :

"That he would be a bold therapist who would inject a half pint of a 1 to 1000 solution of bichloride of mercury daily, in the hope of obtaining such a saturation of his patient that he should be unfit ground for the existence of the germs already within him."

Such a one would certainly add to his boldness the extreme of folly. It is very evident that Dr. Cornet did what Professor Keyes said excessive doses of mercury would do—*i. e.*, produce fatal results. In fact, he admits that the animals, or many of them, were poisoned. He, therefore, defeated the object sought to be obtained, hastening the disintegration of the blood and the death of the animal.

From an experience beginning in March, 1884, and extending to the present, it is my opinion that we have in the different preparations of mercury, administered to phthisical patients in small doses, the most potent weapon with which to combat this most malignant foe of mankind; that in a majority of its victims, so treated, improvement may confidently be expected, and a goodly per cent. cured.

IMPERFORATE ILEUM.

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IMPERFORATE ileum is a term I wish to apply to a congenital defect in the small intestine induced by variations in the obliteration of the vitello-intestinal duct. Although imperforate anus or rectum and imperforate pharynx are well recognized, similar defects occurring in the duodenum and the ileum have never met with the attention they deserve, although they are of interest to the surgeon.

On the present occasion my remarks will be confined to the ileum, and as the condition under consideration depends upon the vitello-intestinal duct, it will be necessary to review briefly the main facts in the anatomy of the yolk-sac and its duct. The degree of development of this remarkable organ varies greatly in different vertebrates. In placental mammals it is usually small; in birds, reptiles, and fish it is large. In all it is a temporary store of nutriment, whilst in some sharks—*e. g.*, *Mustelus lævis*, as Aristotle knew, although the matter was neglected until rediscovered by Johannes Müller, the long-stalked yolk-sac develops a number of villi which fit into depressions of the uterine mucous membrane, like chorionic villi into the decidua of most mammals. A similar condition also pertains in *Carcharias*.

In its typical form the yolk-sac is connected by means of a duct with the intestine, and it is somewhat curious that although the sac is in direct communication with the bowel, the yolk is absorbed by the vitelline (omphalo-mesenteric) vessels ramifying on its walls and thus conveyed to the embryo. In elasmobranchs, however, the yolk passes into the intestine by the duct, as well as by the indirect route through the vitelline vessels.

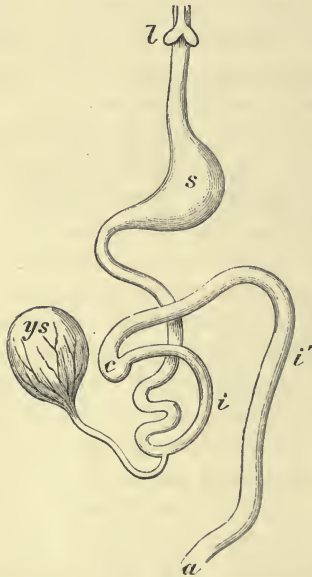
We are thus faced by the curious fact that although this sac communicates with the intestines directly, its duct, except in the case of elasmobranchs, is functionless.

In mammals, at the time of birth, the yolk-sac and its duct are normally reduced to very slender proportions, and occasionally may be detected as delicate structures attached to the umbilicus. In birds the duct at the time of hatching is usually seen as a nipple-like process standing upon the free surface of the ileum. In most fish it is very large and conspicuous, and remains attached to the young fish for many days after hatching. In some mammals, as rodents and carnivora, the yolk-sac is conspicuous among the membranes. The relation of the yolk-sac

and its duct, or umbilical vesicle as it is often called in the human embryo, is somewhat diagrammatically shown in Fig. 1.

Before discussing the abnormalities presented, or caused by, this duct, it is necessary to state that the vitello-intestinal duct consists of two parts, an intra- and an extra-abdominal segment. The intra-abdominal portion extends from the ileum, at a spot varying from one to three feet from the ileo-cæcal valve to the umbilicus. This portion of the duct usually disappears long before the distal or extra-abdominal portion,

FIG. 1.



A diagram showing the relation of the duct of the yolk-sac, *y s*, to the ileum, *i*; *s*, stomach; *l*, lung; *c*, cæcum; *i'*, large intestine.

which, as has already been stated, frequently persists in many orders of mammals until birth and is shed with the placenta. Dr. William Allen has suggested that the early disappearance of this, the intra-abdominal section of the vitelline duct, and the persistence of the sac and extra-abdominal piece of the duct, may be explained thus:

"The umbilical intestinal loop is drawn into the abdominal cavity as the rest of the alimentary canal grows; this movement, then, on account of the fixed position of the umbilical vesicle outside, causes the vitelline duct to be stretched, so that it very probably soon ruptures, and is then speedily absorbed."—*Journal of Anat. and Phys.*, vol. xvii.

We will concern ourselves with the abnormalities of this intra-abdominal segment of the duct. This portion, instead of disappearing, may grow *pari passu* with the gut, and may even equal it in size; it is then

known as Meckel's diverticulum, for it is to this distinguished anatomist we are indebted for a clear account of the abnormality and the relation it bears to the vitelline duct. Meckel's accounts of this structure, the clear and convincing method he adopts in associating this so-called diverticulum with the duct of the yolk-sac, are models of anatomical investigation and leave not a shadow of doubt as to their accuracy, so that, at this distance of time, we may really wonder why Cuvier, Oken, Emmert, and others expressed sceptical opinions as to the correctness of Meckel's conclusions.

In its most complete form the persistent duct opens at the umbilicus and bowel-contents escape externally. Such a specimen is usually provided with a mesentery, has all the structural characters of small intestine, and presents Lieberkühn's follicles and Peyerian patches. Such a complete duct is rare. More frequently it exists as a nipple-shaped prominence standing from the free border of the ileum, resembling that seen on the ileum of a newly hatched chick. The duct may be two or three inches long and then be continued as an impervious cord to the umbilicus. In exceptional cases the diverticulum has been eight and even ten inches in length. Usually the end of the diverticulum is rounded like the bottom of a test-tube, occasionally it is hammer-shaped. In rare instances a diverticulum has been found distended into a cyst holding several ounces of fluid. Such specimens occur usually in *foetuses* otherwise malformed.

In its variations, structure, and pathological deportment the intra-abdominal portion of the vitelline duct is on all fours with the vermiform appendix. This structure may be absent, or vary in length from one to four, or even eight inches; sometimes it is an impervious cord, possesses a mesentery, and at times is dilated into a large cyst.

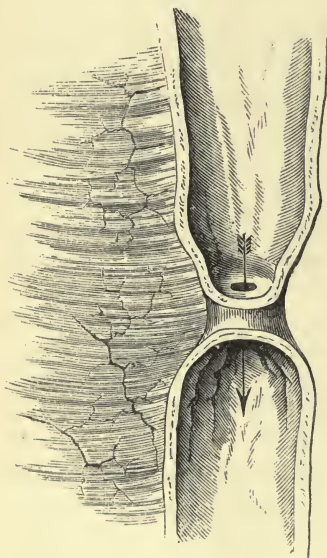
Thus far we have studied examples of abnormal persistence of the duct; we must now consider some specimens of the reverse condition, excessive coalescence of the duct. Normally, the obliteration of the duct becomes arrested at the spot where it joins the ileum, and the process of obsolescence is so complete that the most critical eye fails to detect the least evidence of its former existence. Occasionally the obliterating process exceeds the normal limit, and involves the wall of the bowel, giving rise to a shallow furrow running round the gut. This furrow often corresponds to a diaphragm on the inner aspect of the bowel; the centre of the diaphragm is perforated (Fig. 2).

In another case the bowel becomes so narrowed that the ileum presents a sort of constriction or isthmus. This isthmus varies in size, but may be as narrow as a crow-quill. The ileum on the proximal side of the constriction is dilated, the walls thickened, and the muscular coat hypertrophied (Fig. 3).

In a third class of cases the ileum will be found interrupted, as in

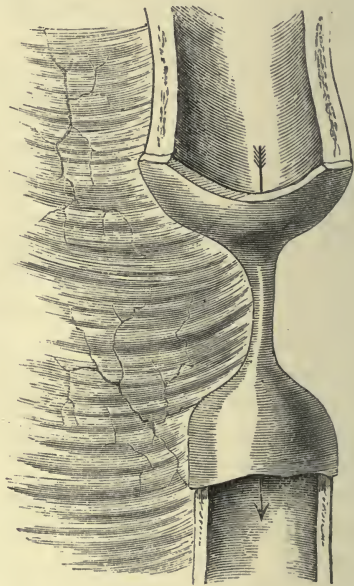
Fig. 4, the prominent end being distended and the distal end shrunken. The degree of separation varies greatly. In my first specimen the two culs-de-sac were lying side by side; in my second and third specimens they were separated by about an inch, and a gap measuring twelve inches has been found between the ends. Exceptionally the ends may be joined by an impervious band of fibrous tissue.

FIG. 2.



A valve in the ileum. (Semi-diagrammatic.)

FIG. 3.



The ileum interrupted by a narrow isthmus. (Semi-diagrammatic.)

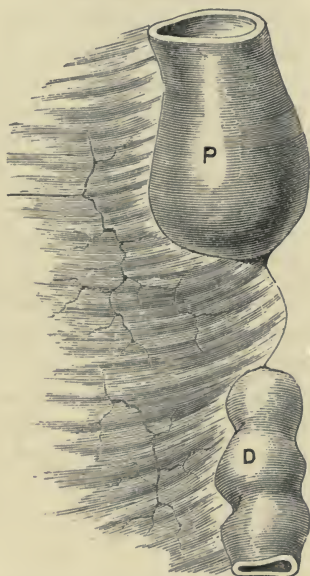
In two recorded cases the intestine below the interruption was narrow, shrunken, and traversed by an almost capillary lumen as far as the ileo-cæcal valve. Such a shrivelled condition may even be presented by the big gut under such circumstances.

Up to the present time I have had opportunities of dissecting three specimens of completely imperforate ileum. The first two came to hand in the ordinary course of dissections conducted on stillborn children; my third specimen has an interesting history:

In June, 1889, my friend, Dr. Maxwell, asked me to see a baby forty-eight hours old, concerning which he furnished the following history: The abdomen was found distended shortly after birth, and the baby commenced to vomit its food. On examining the anus the parts were found quite normal, and a catheter could be passed readily into the bowel for many inches. Nothing but mucus passed by the anus. It was clear that we had not to deal either with imperforate anus, rectum, or pharynx, as the infant could swallow easily, and as it retained milk for

a time, imperforate duodenum was excluded. I therefore came to the conclusion that, we had to deal with an imperforate ileum. At the request of the parents, I explored the abdomen, and found the ileum imperforate at a spot about eighteen inches from the ileo-cæcal valve. The distal end of the ileum was somewhat shrunk and separated from

FIG. 4.



Complete form of imperforate ileum. P, proximal; D, distal cul-de-sac.

the proximal end by a gap an inch across, Fig. 4. The upper cul-de-sac was dilated with meconium, and congested; this was removed and the end of the gut stitched to the abdominal wound. Meconium and flatus passed freely, the child rallied and took food, and the case promised to go well, but about six hours later it suddenly expired.

As far as I know, this is the first time the existence of an imperforate ileum has been diagnosed during life, and it is probably the first time an attempt has been made to deal with such a condition operatively. Cases of this sort in infants are surely fatal, but the less marked examples, such as the cases described by Mr. C. L. Hudson, in *Trans. of the Pathological Society*, vol. xl., are not incompatible with life, for both these specimens were taken from youths.

These patients, however, died with symptoms of chronic intestinal obstruction. It is very probable that some specimens of narrowing of the ileum, which have been ascribed to contraction of the mesentery, really are abnormalities connected with the vitello-intestinal duct.

The grounds for attributing defects of the ileum to excessive coalescence of the intra-abdominal section of the vitello-intestinal duct are

these: Congenital obstruction and narrowing of the alimentary canal are always found in the situation of embryological events; for instance, imperforate pharynx occurs at the spot where fore-gut and stomodæum come into contact. An imperforate or septate duodenum occurs just above the bile papilla, the region where the diverticulum issues to form the liver and pancreas. Imperforate rectum and anus are due to imperfect union of the hind-gut and proctodæum. Lastly, imperforate ileum occurs in the region where the primitive alimentary canal is in communication with the yolk-sac by means of the vitelline duct. My views concerning the relation of this duct to imperforate ileum were originally put forward in some lectures I delivered at the Royal College of Surgeons in 1887, and published in abstract in the *Lancet* of the same year. Since then this view as to the connection of the defects in the ileum with the vitelline ducts has been rendered stronger by some specimens admirably reported by Mr. C. L. Hudson, to which allusion has already been made. These specimens are valuable, as we are now able to trace every gradation from a persistent duct to complete division of the ileum.

My object in drawing attention to this matter is, that those who have opportunities of investigating this condition of the intestines in fœtuses and young children, will be induced to place such cases coming under their notice on record, as additions to our scanty knowledge of this curious defect.

LOCAL TREATMENT OF DIPHTHERIA.

BY J. C. MULHALL, M.D.,

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ST. LOUIS.

THERE is hardly a familiar disease concerning which the evidence of witnesses is more conflicting than in diphtheria, no matter from what standpoint it may be viewed. Statistics, based on mistakes in diagnosis, on the varying nature of epidemics, on faulty reports as to anatomical regions invaded, and on our own general ignorance as to its method of diffusion, its etiology and pathology, no doubt account for this confusion. A vast number of agents have been employed in the local treatment of the disease with the usual conflicting testimony as to value. It is, however, chiefly concerning the *method used in their application* that I desire to draw attention to a plan which for four years has yielded me gratifying results.

When I originated this plan, I took for granted several propositions commonly accepted by observers. *First.* That the disease is a germ

disease. *Second.* That in the vast majority of cases the specific microbes selected the tonsils as their initial culture soil. *Third.* That unless checked by germicides their colonization usually resulted in local putrefactive changes with general secondary septicæmia. *Fourth.* That implication of laryngeal or nasal chambers largely increased the mortality. *Fifth.* That the disease is acutely adynamic.

It occurred to me, therefore, that, as was already largely practised, the local treatment should be chiefly antiseptic, and that, as the disease spread rapidly and the salutary effects of antiseptic solutions in the upper air-passages, from anatomical reasons, could be of but short duration, this antiseptis should be, if possible, continuous.

It will be readily admitted that it is of the utmost importance to maintain the patient's strength and that, therefore, an element in ideal local treatment, is, other things being equal, the employment of agent and method which least harass the child and which permit throughout the recumbent attitude.

It suggested itself that a method which washes out from the throat the perverted secretions is preferable to that which invites a subject too young to expectorate to swallow them, and which permits the larynx to be bathed in them, as must occur in the use of a spray. The instrument with which these requirements can best be met is one which is found in nearly every domicile, namely, the common household syringe. It is a fact not generally known that if the end of such an instrument be introduced into the pharynx or into the back part of the mouth of a young child, that the throat can be boldly flushed and without causing gagging, vomiting, coughing, or strangulation. Reflexly, the tongue immediately retracts, pushes the epiglottis down, making a water-tight glottis, and the child involuntarily ceases to breathe, whilst the pharyngeal irrigation goes on.

The first treatment, like any other first local treatment in a young child, is met with repulses, but even very young children soon learn to appreciate the agreeable effect of clearing the throat of foul and adhesive secretions, and soon quietly submit. With badly trained children, some of whom even repulse the nurse when she smears the nostrils and lips with a soothing ointment, I commonly use the rectal tip, or better a pewter tip, which can be curved so as to be insinuated behind the last molars; but ordinarily I use no tip, simply the rubber hose, which is soft and has the further advantage of providing a larger stream.

The physician himself carries out the first treatment as a demonstration to the nurse. The child lies in a crib, one side of which is open; a rubber cloth conducts fluids into a vessel, the child's head is brought to the edge, the face turned toward the vessel, and the flushing is rapidly accomplished. The exertion even of sitting up is avoided.

Usually, I direct the washing to be done every hour in the waking state, and never to permit the child to sleep three hours without it.

I have used various antiseptics. I prefer a mixture of carbolic acid and compound solution of iodine, properly diluted with warm water, which frequently in addition is saturated with boracic acid. An ordinary water tumbler of fluid is consumed at each irrigation.

This plan is so far imperfect, since it does not provide for disinfection of the post-nasal region, and there are few cases of diphtheria which do not implicate this region, rich in lymphatics and, probably next to the tonsils, most frequently the line of poison march to the system at large. I have been amazed in consulting practice to observe the frequency with which the nose has been neglected until serious nasal signs, such as hemorrhage, fetor, or total obstruction have compelled some kind of attention, very often too late, for this triad of symptoms is most commonly the harbinger of death.

If we consider that the general practitioner is usually unacquainted with rhinoscopy; that even the expert is often foiled in illuminating and seeing the nasal cavities of a young child; that the nose, which the evening before seemed uninvaded, is found in the morning to be seriously affected; it can hardly be gainsaid that prophylactic treatment of the nasal cavities in pharyngeal diphtheria is a wise therapeutic measure.

Antisepsis of the nasal cavities can do no harm, whilst it may prevent, or render mild, invasion from the throat. Moreover, since for many reasons we cannot in these cases treat the pharyngeal vault from the mouth, the anterior nasal cavities form ready avenues of approach for the disinfection of this region—and this is an integral part of my plan of continuous antisepsis. Let me repeat, that apart from this being a channel for the antiseptic treatment of the throat, *I desire to recommend strongly to the profession that in every case of diphtheria, whether the nose be affected or not, that the nasal cavities be kept strictly sterile from the first.*

The method of accomplishing this varies. When it is clear that neither the post-nasal nor nasal chambers are attacked, the frequent insufflation of a non-irritating antiseptic powder may be sufficient. When uncertainty exists, or it is apparent that invasion has taken place, the nurse is instructed to wash out the nasal cavities with the same antiseptic solution as that employed in the throat, except that it should be far weaker, so as to irritate the nose as little as possible, and should seldom exceed in amount more than two teaspoonfuls for each nostril. The child, if possible, clears the nose and the antiseptic powder is at once forcibly insufflated. This, as the child lies on its back, gradually trickles into the pharynx and assists in the plan of continuous antisepsis. I commonly use finely powdered sulphur, or iodoform, or salicylic acid highly diluted, with a trifle of cocaine to prevent irritation.

This cleansing of the nose should not be done with the household syringe, for it throws a stream too small in diameter, and one far too forcible in careless or unskilful hands, nor does it permit of the regulation of the amount of fluid to be injected.

The point of the ordinary glass syringe introduced into the nostrils of an impatient child is apt to produce an undesirable wound of the septum. Moreover, the calibre of the nozzle is far too small, permitting a slender, swift, painful, and inefficient stream. The syringe made for me by Mr. J. M. Good, a druggist of St. Louis, fulfils, I believe, the ideal requirements of a syringe for anterior nasal medication in young children. Its capacity is about two drachms. It terminates in a bulbous enlargement which prevents a forcible stream, forms a shoulder to rest against the margins of the nostrils, and since it terminates abruptly in the nozzle, cannot enter the nose and abrade its mucous membrane. The diameter of the outlet is one-fourth of an inch, thus permitting a large yet gentle stream. Before I invented this syringe I was in the habit of filing through a small glass syringe at its neck where the diameter was large, thus avoiding the objections to the tip. The nozzle thus altered should be held in an alcohol flame to smooth away irregularities.

The frequency with which the nasal cavities should be irrigated is a matter of individual judgment. Gently and quickly done with agents that are not painful, children readily submit to it—an important matter, for whatever the plan of local treatment be in the adynamic diseases of children, that plan is best which, other things being equal, meets with least resistance.

The rapid dissolution of the membrane is undoubtedly an element of successful local treatment, and I frequently make use of solvent remedies immediately succeeding the cleansing of the diseased surface. I have best succeeded with papoid.

There is but one method of local medicinal treatment which can be efficiently pursued in the laryngeal diphtheria of children: that by vapors. At appropriate stages the inhalation of the fumes of slaking lime deserves always to be remembered.

I beg leave to call attention to a modification of the plan of Delthil, which I have hitherto employed in seven cases with a final result of four recoveries and three deaths. A small apartment in the house is selected, the carpet and other belongings removed; the room is thoroughly fumigated with sulphur, and a sheet saturated with a disinfectant spread across the doorway. A gas-stove is introduced which will support two vessels. Into each is poured a half gallon of water. Into each of these a half pint of pine tar is stirred and a tablespoonful of oil of turpentine. As steam is generated water is occasionally added, so that the half gallon mark is maintained. The amount of tar will be sufficient for the entire treatment, but to each vessel is added every hour a tablespoonful of the

oil of turpentine. I have not as yet observed strangury, or the characteristic odor of the drug in the urine. The air from outside should be admitted several times daily. The heat from the gas precludes this method in warm weather.

In three of my cases, with one death and two recoveries, I was able to demonstrate membrane with the laryngoscope. The four children safely passed the laryngeal crisis with but little cough and no glottic spasm. In a boy aged four, seen with Drs. Holland and Frazer, of St. Louis, who died on the seventeenth day from exhaustion, but the slightest dyspnœa was at any time observable, though total aphonia existed, and I was able to demonstrate to these gentlemen the presence of membrane in the larynx. The steam is generated day and night, and in one of my cases was continually done for six days.

In diseases in other parts of the body, whose natural termination is in putrescence, the surgeon, in anticipation of this event, or on its actual arrival, thinks first of antiseptic measures.

It is, therefore, probable that analogous measures are the best that can be employed in diphtheria.

I have endeavored to describe a reasonable method of execution.

HYSTERICAL ANÆSTHESIA, WITH A STUDY OF THE FIELDS OF VISION.

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AND

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THE achromatopsia, or dyschromatopsia, which has been described by various authors as occurring in hysteria, and especially in those cases in which the not uncommon symptom of hemi-anæsthesia is present, was first studied by Galezowski,¹ especially in Charcot's wards of the Salpê-

¹ Galezowski (Thèse, 1865, p. iii.) reported the first case of hysterical amblyopia, which was observed in the service of Dr. Grisolle, in the Hôtel-Dieu. The patient was a Miss V., aged nineteen, who, in addition to the entire list of hysterical symptoms presented trouble with the left eye to such an extent that she could only read large letters, and had complete internal hemiopia. With this eye she had also lost the faculty to distinguish colors, so much so that yellow and pink appeared white; red and blue seemed black. This condition lasted for two weeks. See also Gazette des Hôpitaux, 1877, page 75.

rière. Briquet has called attention to the forms of amblyopia which sometimes accompany hysterical losses of sensibility, and Landolt,¹ also working with Charcot, examined and reported many cases. These all seem to have presented unilateral anæsthesia with changes in the extent or arrangement of the fields of color-vision, chiefly in the eye of the affected side, or total loss of color-perception in one eye. It is rarely, says Landolt, that both eyes are not in some degree deranged.

Charcot describes the arrangement of the color-fields as follows:

"There are colors for which the visual field is physiologically more extensive than for others, and these differences in extent of the visual field are always reproduced, following in every case the law for each color. Thus, the field for blue is the largest; yellow, orange, red, green follow in this order, and last, violet is perceived only by the most central portions of the retina. In the pathological state with which we are concerned these characteristics of the normal condition appear in some sort exaggerated, but in varying degrees. The various circles which correspond in the examination with the limits of vision for each color, narrow concentrically after a fashion more or less marked, following the rule established by the normal condition."

Instead of simple concentric diminution of the color-fields, some of the French patients had a reversal of the order of occurrence of the colors, and some bad cases had absolute loss of the color-sense, seeing everything, as Bernutz phrases it, like a sketch in India-ink.

Bernutz, in speaking of the loss of sensibility in hysteria, says that

"Anæsthesia, either of the whole body, which is infinitely rare, or of one-half, and that usually the left half of the body. . . . constitutes . . . one of the primordial symptoms of this neurosis."

He adds that it may be said to be a general rule that the anæsthesia is limited to one part, perhaps of the skin of the body, perhaps of the mucous surfaces, in especial that of the conjunctiva of the left eye, "which exists in almost every hysterical subject, with or without achromatopsia, as described by Galezowski."²

Since attention was called to these cases in this country, many have been carefully studied for color and general pain- and touch-senses in the clinic of Dr. Weir Mitchell at the Infirmary for Nervous Diseases, and the following reports show some of the results. We have not thought it necessary to give the histories of our patients in more detail than would suffice to show their hysterical characteristics clearly, and careful statements of the tactile, thermal, and pain sensibility—as these are the points of whose relations with the changes in the color-sense we wish to speak.

CASE I. *Complete hysterical analgesia; aphonia; normal visual fields.*—Private patient, aged sixteen, small for her age. She has been menstruating irregularly without pain, and is the youngest of a large family in the South. She had been indulged from her birth and had naturally

¹ Archiv de Physiolog. normal. et patholog., tome ii, 1875, p. 624.

² Nouveau Diction. d. Méd. et Chir., art. Hysteria.

lost all power of self-control, having been denied the advantages of control by others.

In May, 1888, she became nervous and was taken ill at a school whither she had been sent against her will. During this illness an overdose of mercury slightly salivated her, and after this she became better. She was at this time attacked with aphonia, became very violent, refusing all food for days, and screaming if any noise offended her hearing, which had become extremely sensitive. The bowels were costive and had to be kept open by enemata.

A careful examination showed all her organs to be in good order, but she had what has been described by Dr. Mitchell, in his book on the *Nervous Diseases of Women*, as "hysterical ataxia." The fear of a fall or other accident from this trouble of incoördination indisposed her to attempt to walk, or to use her will, and she was becoming rapidly will-less. The urine was clear, but it was passed only once in twenty-four hours, sometimes only once in forty-eight hours, and then not more than two or three ounces. For some weeks she did not pass more than four ounces a day. She was analgesic from head to foot, almost as completely so as was Case II.

It is best illustrated by saying that she had no sensation in the breast or under the finger-nails. The most severe test of this condition with which we are acquainted, is the use of a faradic current with two wire brushes on the nipple. To this she was perfectly indifferent. Nevertheless, her sense of touch was fair and her localization good, but her appreciation of thermal differences was very feeble. Unless the temperature was extreme, she found it difficult to decide if it were heat or cold.

The examination of the eyes revealed the following conditions: Vision one-half and two-thirds respectively of normal, which, by the correction of a hypermetropic astigmatism under a mydriatic, rose to full sharpness of sight. The following formula was found to correct the optical error:

$$\text{O. D.} + 1.00^s \text{ C} + .90^c \text{ axis V. } \frac{20}{xx}.$$

$$\text{O. S.} + 1.50^s \text{ C} + 1.^c \text{ axis V. } \frac{20}{xx}.$$

There was deficiency in the amplitude of accommodation corresponding to the error of refraction, together with a low degree of insufficiency of the internal recti. The ophthalmoscope revealed oval disks, somewhat distended and slightly tortuous retinal veins, with undue prominence of the central lymph sheaths. There were no abnormal pupillary phenomena. The form-fields in each eye were absolutely normal. The color-fields—blue, yellow, red, green—followed in the order given and without any material contraction. Thus in the right eye:

	Outward.	Upward.	Inward.	Downward.
Blue	75	38	42	48
Yellow	75	28	32	38
Red	55	30	25	35
Green	45	20	25	25

The left eye presented no material difference from that just recorded. These observations were several times repeated, the last time just before the patient was discharged.

It is not necessary here to go into the treatment, but the little savage was easily tamed, and after three months' time went home in blooming health and has had no relapse since.

CASE II. *Complete hysterical analgesia; nearly normal visual fields.*—Private patient, aged twenty, single, white, living in Pennsylvania. Family history unusually good. No injury, no special disease, no bad habits. She was in good health until she began to menstruate, between twelve and thirteen years of age. At this time she became easily excited by emotion whether of pain or pleasure. Her face began to twitch, and she suffered from a moderate amount of insomnia, which continued as she developed. At sixteen she had attacks of neuralgia in the head, face, and hands; these were not usually very great; occasionally they would be severe. Sometimes the headache would be in one eye, sometimes in the other. The menstruation, which up to this time had been perfectly normal, began to be painful. She complained of "ovarian tenderness." On examination there proved to be no uterine disease whatever. The organ was in place and normal, nor were the ovaries sensitive on vaginal exploration; nevertheless, the abdomen on both sides was extremely sore, and she had been said to have ovarian tenderness. The organs of digestion were in good order. The pulse was easily excited, but the arterial tension was normal. Respiration was 25; the pulse 85. The sleep is slight and easily broken. Her general strength is moderate, but a walk of two miles excessively fatigues her. Her station is bad; on closing her eyes there is three inches antero-dextral sway. There is no vertigo and her gait is normal. There is no paralysis anywhere. Tactile sensation appears normal. As regards her temperature-sense, she sometimes mistakes cold for heat, but never heat for cold, though this is an error sometimes made in health. She is absolutely analgesic from head to foot. There is no part of her body into which it is not easy to thrust needles without causing her any other sensation than that of mere touch. After she had been subjected to such an examination she could tell from the sensation when a needle was thrust into her, and recognized it as different from a touch, although it was painless. In order to give an idea of the completeness of this condition, it is only necessary to say that a needle could be run into her breast, or under her finger-nails, without giving her the least sense of pain. When she first came under treatment she was nearly insensible to the most violent electrical stimulus, perfectly so to heat. But after a time she regained to some extent the power to feel pain, although never the ability to feel a needle thrust into her. She did not suffer in the least degree from a faradic current going through a wire brush over a dry skin. Excepting that she is extremely sensitive to all emotion, there are no hysterical manifestations whatever.

By June, 1889, she made great general gain in strength, but scarcely any as regards sensory trouble, though well enough to be regularly at work as a nurse.

Examination of the eyes of this case revealed the following facts: Direct vision normal; slight decrease in the amplitude of accommodation corresponding to the presence of a simple hypermetropic astigmatism; no abnormal pupillary reactions; an insufficiency of four degrees of the external recti (esophoria). Each optic disk was a vertical oval, the nasal edge slightly blurred by hazy retina, and the transverse veins distinctly tortuous. An examination of the field of vision (Fig. 1) demon-

FIG. 1.

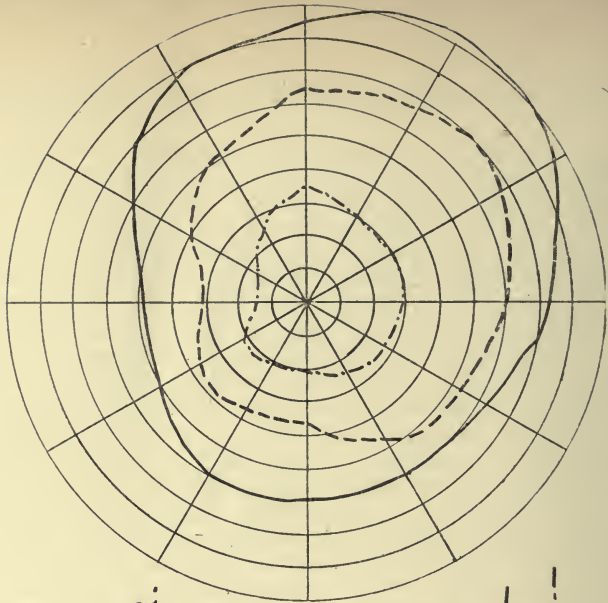
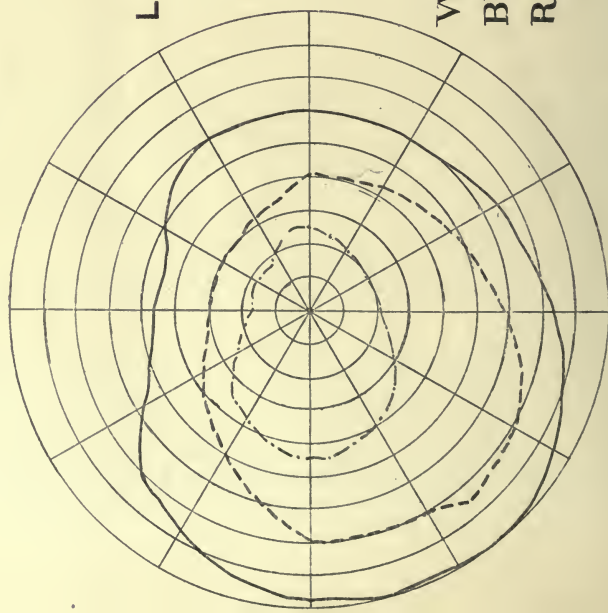
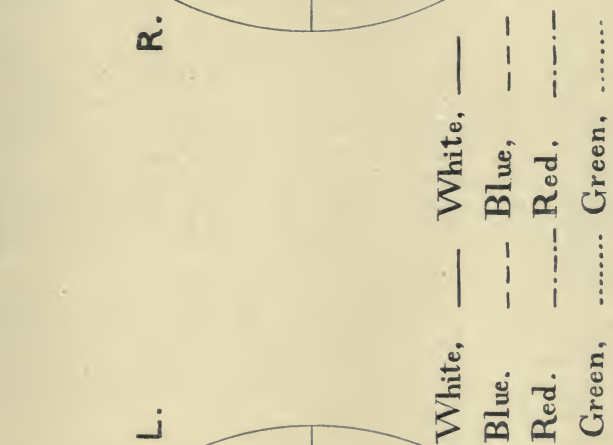
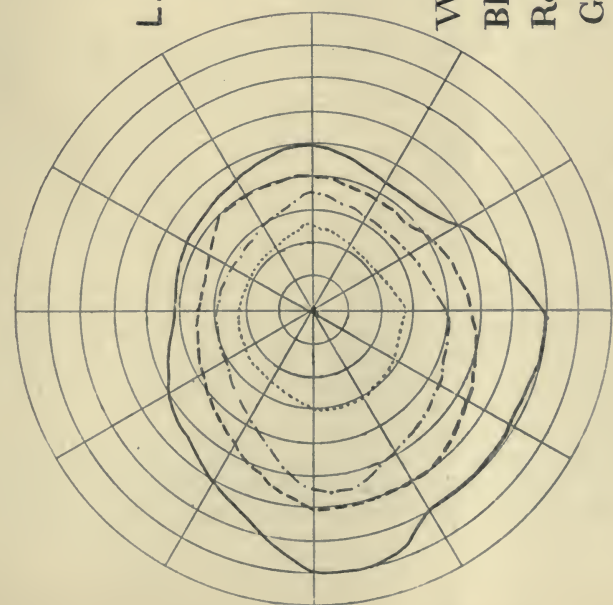


FIG. 2.



strated that there was no change in the relation of the colors one to another, and no decided contraction in the field of vision. This examination has quite recently been repeated now that the patient has gained in general strength, with the result of exactly confirming the previous observation, or, in other words, the field for form, blue, red, and green (green is not represented on the diagram; violet and yellow were not tried) was the same during the period of universal anæsthesia that it is now since the restoration of the patient to more perfect health.

CASE III. *Complete left-sided hysterical anæsthesia; contraction of visual field.*—The patient (private) is a case of neurasthenic conditions with highly hysterical developments. She is constantly in tears, and exercises emotion on the slightest occasion, and even when there appears to be no excuse for the display. She has slight twitching of the limbs, and occasionally hysterical hiccough. The remaining history of this case has no characteristic conditions.

When first seen, in May, 1889, the patient had a very indistinct sense of pain over the whole left side. The needle-prick was felt very little in most places. It was perceived better when plunged into the tissue deeply; it then created a sense of uneasiness. There were a few areas of insensibility. On the thigh and on the inside of the leg the needle-prick was better appreciated, but there was an unusual want of sensibility to pain in the left half of the face, the forehead, and the left hand, whereas in other parts of the body comparative pain was felt. The sense of touch was not quite perfect in her fingers' ends. She was able to locate impressions reasonably well. Heat and cold she could determine with tolerable ease. She was, therefore, a case of complete lateral left-sided analgesia.

The following notes describe the condition of the eyes: Central vision normal; no muscular anomalies either in the external or internal muscles. Oval optic disks, with slightly mellowed nasal edges, and full central lymph-sheaths. Low hypermetropia. The fields of vision (Fig. 2) exhibit concentric but irregular contraction without change in the normal order of white, blue, red, and green.

CASE IV. *Distributed incomplete hysterical anæsthesia; irregular contraction of the visual fields, and partial reversal of the normal relation of the colors.*—This case (private) does not differ greatly from other cases of the hysterical state. There is slight weakness of the legs. The proverbial mobility of all hysterical symptoms is well shown in the distribution of the anæsthetic areas. All over the body want of sensibility to pain is found in patches, but from day to day the situations of these spots vary very greatly. There is the usual complete acuteness of touch-sense, except that it is less perfect than normal in the fingers at all times.

Repeated examination showed that the areas of anæsthesia were frequent, and more marked in general upon the left side, especially the left arm and leg, while other spots of insensibility were distributed over the right side and scattered irregularly over the trunk, face, and limbs. The patient herself was fully conscious of the lessening of sensibility, and hailed with delight the rapid recovery of feeling under the daily use of the faradic current and a wire brush.

An ocular examination revealed no change in the central vision, in the external excursion of the eyes, or in the pupillary reactions. The optic disks were oval, the edges slightly blurred, and the refraction a low hypermetropia. The fields of vision (Fig. 3) revealed decided con-

FIG. 3.

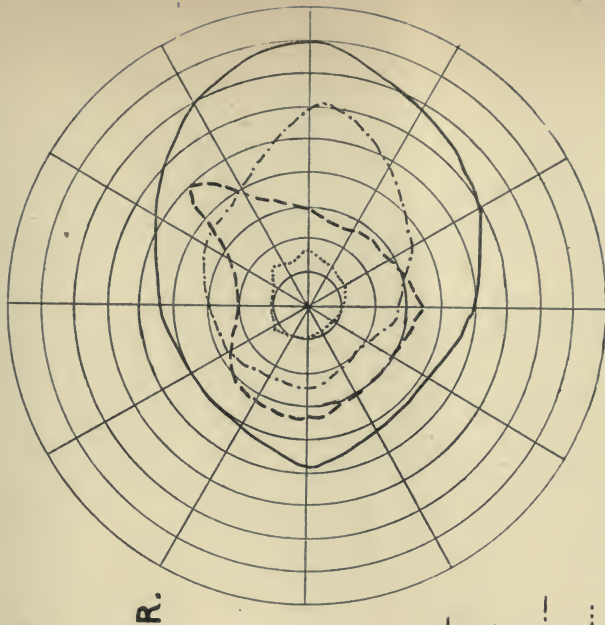
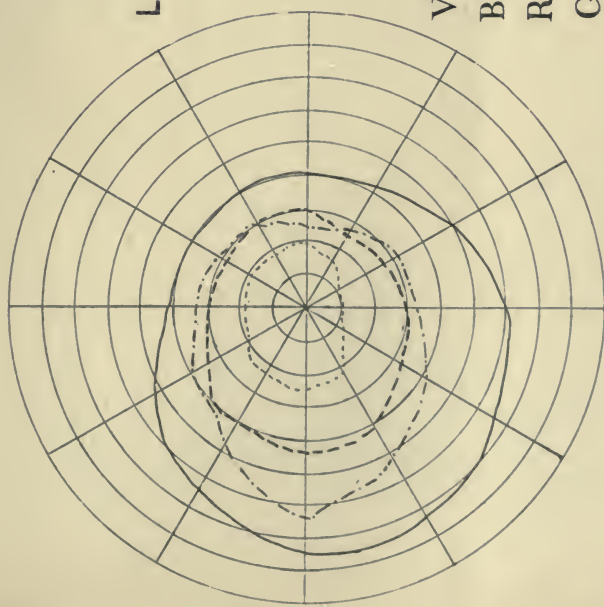
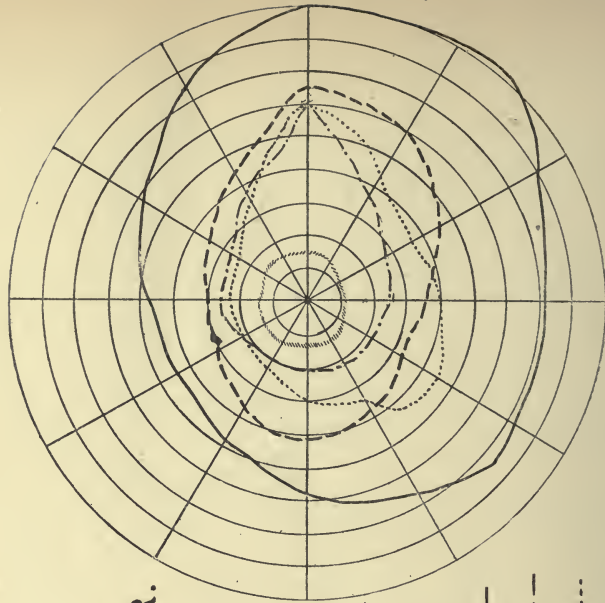
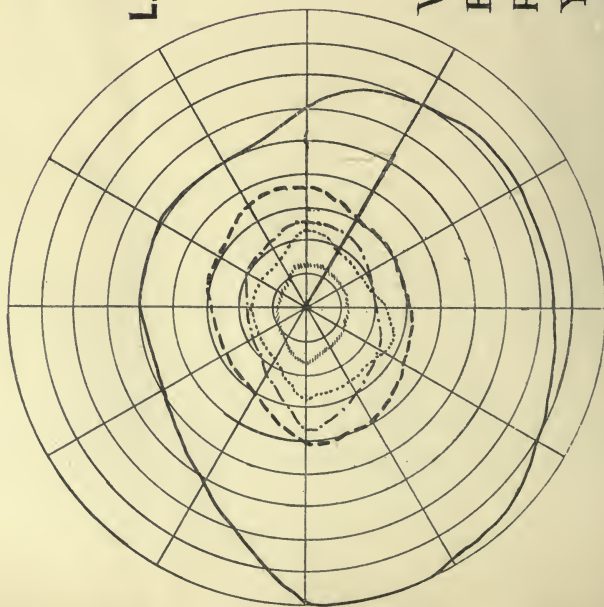


FIG. 4.



White,	—	White,	—
Blue,	- - -	Blue,	- - -
Red,	- . - .	Red,	- . - .
Yellow,	.....	Yellow,	.....
Green,	.....	Green,	.....

traction both for form and for blue, red, and green (yellow and violet were not tried).

Right eye: The blue and red lines cross each other in such a manner that on the nasal half and below, the blue is greater in extent, while in the temporal half and above, the red is larger in area. The green, greatly restricted, occupies its natural position in the sequence of the colors.

Left eye: The red field is greater in extent than the blue field in the entire circumference except at the horizontal meridian of the nasal side; the blue and then the green field, much contracted, follow.

CASE V. *Complete left hysterical anæsthesia; contraction and œdema of the left leg; irregular visual fields; partial reversal of the color-fields.*—Patient (private), aged thirty-one, is the mother of three children, the youngest born three years ago. Menstruation is nearly painless. There is no organic disease. In July, 1887, she had a sharp attack of dysentery, which lasted over a week, after which she had what was probably hysterical paralysis of the bladder and rectum. The urine had to be drawn off, and the rectum emptied of its contents by mechanical means. At this time she became extremely nervous, and had "sinking spells," with spasms of the left side of the face, head, and foot. The left hand became violently shut, and the foot passed into a state of extraordinary extension.

The difficulty chiefly complained of at present (May, 1889) is a hysterical contraction of the left leg. The knee can be straightened with difficulty, but it soon regains its bent position. If, as she states it, it is "locked" in a straight position, it remains so, but, if she attempts to walk, it instantly bends, and refuses to be straightened again. She has curious attacks of œdema of the left hand, lasting for an hour, caused by excitement, whether pleasurable or otherwise. The leg has also at times been swollen above the ankle, and nearly all the time it is a little swollen at the ankle. At her periods this œdema is greatly increased, and becomes then very notable. She has ache of the spine; in four or five places pressure causes pain, the situation of which varies. The whole left side is more or less insensible to pain. It is worse in some areas than in others. The sense of touch is considerably impaired. The compass points are not felt as two anywhere on the fingers or lips. The sensation as to heat or cold is imperfect on the left side. Heat is felt as pain, unless it is very great. This observation is often made in reference to other cases, and is somewhat difficult of explanation. The case is worse when seen than would be supposed from the notes.

The following notes describe the condition of the eyes: Vision two-thirds of normal in each eye. Pupils large, equal, and actively responsive to the reactions of light and shade, convergence, and accommodation. Distinct insufficiency of the internal recti muscles. Oval, rather gray, optic disks with hazy nasal edges. Many lymph reflexes throughout the eye-ground. No macular lesions. The refraction a simple hypermetropic astigmatism. In the fields of vision the following peculiarities were noticed (Fig. 4):

Right eye: An irregularly contracted form-field. The blue field is next in extent, except below and to the nasal side, where it is exceeded in limit by the yellow line, which in turn is the next largest field, except above, where it is surpassed in extent by the red field. In the *left eye* there is a distinct contraction of the form-field especially above, contraction, but natural position of the blue field, while the red and yellow

lines cross each other in such a way that in all meridians the red is the greater in extent except directly below. In both eyes the green field, much contracted, occupies its natural position in the sequence of the colors.

CASE VI. *Hysterical swelling; paresis and incomplete anæsthesia of the left arm; normal visual fields.*—Hospital patient (service of Dr. S. Weir Mitchell), aged twenty-eight, teacher. Has had no injury or disease capable of producing serious consequences. Previous to May, 1886, she appeared perfectly well, but was over-worked and had some worry. She began to notice that she was physically feebler than she had been, but she continued at her work. By degrees she became insomnic, waking early in the morning. She complained of some pain in the back, and gave up work in May, 1886. She continued to take care of herself without doing any work during the summer. She still suffered a great deal in the back of her head and neck, and with a painful spine, all of which troubles were increased by fatigue and excitement. In October, she observed that at her periods the right arm began to swell. Soon after it was found to be always swollen. In February, she ceased to be able to write, and every motion increased the swelling. At this time there began a sensation of burning in the arm, although it was cool to the touch, and this was increased by use. The arm at present seems to vary very much in size. (See Table I.) All excitement or emotion is felt in the arm, and she insists that all shocks are felt in that member, or, as she says, "go to the arm." In obedience to the law which seems to control this form of œdema it varies greatly; sometimes the swelling does not extend above the elbow, and sometimes it reaches to the shoulder. Undoubtedly, at her worst, the right leg is affected as well. The right breast is certainly smaller than the left at all times. At seven inches above the wrist the right arm measures eight inches in circumference, and the left seven and a half inches. For the right hand the dynamometer registered 25 and the left 25, but she says the right hand used to be twice as strong. K.-J. ++ on both sides; reinforcement normal on both sides. On the right side, however, there is a faint attempt at clonus, the foot moving three or four times and then coming to a pause. The arm muscles and elbow-jerk are normal.

TABLE I.—MEASUREMENTS OF WRIST, MIDDLE, AND UPPER FOREARM, IN INCHES, BEFORE AND AFTER MENSTRUAL PERIOD.

	Wrist.	Middle forearm.	Upper forearm.
March 7. Day before menses appeared,	6½	7½	9
During this period she suffered unusually.			
March 13. Third day after cessation of flow,	6½	7	8½
March 16	6¾	7¼	8¾

At this time she went home for a week, and while there wrote a good deal, the arm becoming worse. On her return a careful examination was made as to sensation, which had been neglected at the previous examination. The pain-sense below the elbow was greatly reduced in the right arm, scarcely existing at all. Touch-localization was much less perfect than it should have been. The condition was difficult to state with exactness, as the distribution of the change seemed unequal. Everywhere from the shoulder to the elbow the tissue was difficult to pick up with the finger and thumb. A large part of the swelling was

clearly not œdematous in the sense in which we use that term. A very remarkable change was observed in the temperature of the two hands, which is illustrated by the table appended.

TABLE II.

		Morning.		Evening.	
		R.	L.	R.	L.
February 13.	Hand . . . . .	...	...	97 $\frac{4}{5}$ °	98 $\frac{2}{5}$ °
	Arm . . . . .	...	...	94 $\frac{4}{5}$	96 $\frac{2}{5}$
	Axilla . . . . .	...	...	98 $\frac{4}{5}$	99
February 14.	Hand	92 $\frac{4}{5}$ °	93 $\frac{4}{5}$ °	97 $\frac{4}{5}$	97 $\frac{4}{5}$
	Arm	91 $\frac{4}{5}$	95	94 $\frac{2}{5}$	96 $\frac{2}{5}$
	Axilla	98	98	98 $\frac{1}{5}$	98 $\frac{1}{5}$
February 15.	Hand	95 $\frac{1}{5}$	95 $\frac{4}{5}$	95 $\frac{3}{5}$	95 $\frac{4}{5}$
	Arm	95	95 $\frac{2}{5}$	92 $\frac{4}{5}$	94 $\frac{2}{5}$
	Axilla	98	98	97 $\frac{3}{5}$	97 $\frac{3}{5}$
February 16.	Hand	92 $\frac{3}{5}$	93	86	89
	Arm	90 $\frac{2}{5}$	92 $\frac{2}{5}$	90 $\frac{2}{5}$	92 $\frac{3}{5}$
	Axilla	98	98 $\frac{2}{5}$	97	97

In April, 1888, she was reëxamined, and showed no change for the better. Prolonged pressure showed a small pitting indicating a slight amount of œdema. The analgesia in both leg and arm appeared to be increased.

This seemed to be a rather unusual and irregular case, such as was described by Dr. S. Weir Mitchell in *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, under "Unilateral Swellings of Hysteria." Although the analgesia did not exist through the whole side, it was still sufficient to make it worth while to study the color-fields.

An examination of the eyes revealed no abnormalities other than a slight hypermetropia with corresponding deficiency in the amplitude of accommodation. There were no manifest insufficiencies of the external eye-muscles. The eye-grounds were healthy, with, perhaps, slight thickening of the fibre layer of the retina surrounding the upper and lower edges of small, vertically oval optic disks. A study of the color-fields made on several different occasions failed to determine any decided abnormality for blue and red. The green field was contracted to a smaller limit than that which is usually considered to be normal, and was smaller in contrast to the extent of the other colors. This was present alike in each eye, the fields of each corresponding in area.

CASE VII. *Epilepsy; hysterical hemiplegia; partial left-sided anæsthesia; contracted visual fields.*—Hospital patient (service of Dr. S. Weir Mitchell), aged twenty-eight years, single, American. Since seventeen years of age she has been subject to fits, sometimes one a week, sometimes many in a day. For a week before the first examination she had none. Hereditation is good; both parents healthy. The cause of the patient's disease is unknown: she has no discoverable disease in any organ. At her menstrual period she has some pain in the iliac region, of which she

sometimes complains in the intervals. When the fit is approaching, she has slight pain in the left arm and the præcordium. This lasts for a few minutes, and may exist without any sequent fit. The onset of the spasm is sudden, and affects first the right face and neck; it then becomes rapidly generalized, and sometimes lasts an hour with brief intervals. Occasionally she has had the lesser epilepsy. The disorder is more frequent in hot weather, occurring every other day. Her treatment does not here concern us, and her history is interesting only because she has had attacks of hysterical hemiplegia.

For some two or three weeks past (May, 1889) she seems to have been more nervous and feeble than usual. She complains of pain in her left chest, and there is also a copious eruption of acne on the left side of the chest due to a belladonna plaster. She has been taking twenty grains of bromide three times a day, with arsenic, for two or three months. Increasing nervousness marked the near approach of an attack, which took place May 15th. She had been annoyed and troubled for some days by a variety of matters. While sitting at dinner she found great difficulty in moving her left hand, and felt her face turned slightly to that side, with a sense of tingling at her fingers' ends. Within an hour this developed into moderate chilliness on the whole left side. Neither the speech nor the power of swallowing was affected. Since then she has gradually become better, but still there is very little gain of strength. The dynamometer shows 35 for the left side, and 48 for the right. A sensory examination in this case of the paretic condition is important. Portions of the left side, of the left face, and the fingers of the left hand were slightly altered as to touch, but not enough to enable us to detect any difference by the points of the compasses. As to pain, there was a different state of things. The whole left side was rather less susceptible to pain, even when pain was felt. In the right side, in the right arm and right leg below the knee there was insensibility to the prick of a needle. But here, as in other cases, a sense of pain, which seemed almost extinguished at a number of points, could be made active with the aid of a strong faradic current, if the conductors were dry and uncovered. It is to be observed that in some places insensibility was perfect in a limited area for an inch or two in diameter, but just outside the line sensation was again distinct. Also, it appeared in this case, as in many others, these pain-areas would continue to move. For instance, pain-sense would exist in a given area, and in half an hour that portion of the body would be again insensible. She had, as is usual in persons in this state, a sensitive region on the left side of the abdomen, a soreness which is popularly attributed to sensitive ovaries, but in the present case far too extensive to allow any such explanation.

A study of the eyes showed central vision very defective owing to the presence of a high degree of compound hypermetropic astigmatism associated with manifest convergent strabismus, the left eye being more amblyopic than its fellow. The optic disks were oval, sharply excavated, distinctly waxy in their deeper layers, and the retinas hazy and full of lymph reflexes. The fields of vision for form and color were concentrically contracted about ten degrees in all meridians, but there was no reversal in the order of the colors, nor crossing of the lines, nor reëntering angles, nor peripheral scotomata.

CASE VIII. *Right hysterical hemi-anæsthesia; partial left anæsthesia; reversal in order of color-fields.*—Hospital patient (service of Dr. Wharton

Sinkler), aged thirty; single; Irish servant; family history good; menstruated at thirteen and since irregularly; previous history ordinary. Four years ago she experienced loss of power in the right foot, which became worse on exertion, however slight. The disability travelled upward, involving gradually the foot, the side, and the arm. A numb feeling now affects the leg and back. There are sharp pains along the side of the leg. She says she cannot sit up in bed; but, when ordered to do so, obeys without trouble. There is some twitching of the thigh at night. She walks badly, dragging the right foot. Patellar reflexes + on both sides; reinforcements not obtainable. Repeated blows easily produce very rapid contractions. Elbow-jerk normal on the left side, less than normal on the right. Dynamometer (Burq)—right, 6; left, 27. There is an attempt at ankle clonus (?). Sensation much worse on right side. She distinguishes touch, but cannot differentiate the head from the point of a pin in the right arm, hand, and shoulder. On the right chest and neck she recognizes the point, but not pain. Sensation is less, diminished in the right leg than in the right arm, but it is also analgesic. The left side is also analgesic, but distinguishes head and point. There is no pain on pressure over the nerve trunks.

Globus hystericus is nearly constant.

Heart and lungs normal.

An examination of the eyes elicited the following points: The vision was equal in each eye—two-thirds of normal—the slight deficiency being due to a low grade of myopic astigmatism. The pupils were small, round, and normal in their reactions. The pupillary distance was unusually wide, 68 mm. The fields of vision were found in the following order:

Right Eye.

	Outward.	Upward.	Inward.	Downward.
White	80	38	40	60
Red	25	10	20	15
Yellow	25	10	18	10
Green	18	8	12	7
Blue	5	5	8	5

Left Eye.

	Outward.	Upward.	Inward.	Downward.
White	80	35	40	25
Red	30	12	20	18
Yellow	30	10	18	18
Blue	15	5	10	8
Green	5	5	10	5

From an examination of these numbers it will be seen that in the right eye the red field occupied the greatest area, next and about equal to it was the yellow, then the green, while the narrowest was the blue which, greatly contracted, surrounded the fixation-point. In the left eye the same conditions obtained, except that the green field was in all meridians smaller than the blue, except upward and inward, where it was equal to it in extent. The white field in each eye was much restricted. The optic nerves were oval; in the right eye the color a dirty gray with a sharply marked scleral ring; in the left eye the same gray color in the

temporal half with a brick-dust hue of the nasal side, and similar sharp marking of the scleral ring. The central vessels were unchanged.

It is evident from an examination of these cases that in no instance was there loss of the color-sense, the achromatopsia of Galezowski, nor was there any disappearance of the colors in a constant order. In the two cases of complete anæsthesia there was no departure from the normal sequence of the colors; and, practically, no limitation in the area of the field of the one (Case I.), and but slight restriction in the other (Case II.).

In the cases of partial anæsthesia, in one (Case VI.) no abnormality for blue and red existed; green was by contrast contracted, and in two others (Cases III. and IV.) there was concentric irregular contraction of the color-fields; but in all three the normal sequence of the colors was undisturbed.

In two cases (IV. and V.), while the colors were correctly appreciated, their natural order was changed, the blue, red, and yellow lines crossing each other in such a manner that the red field became in some meridians the greatest in extent.

In only one case (Case VIII.) was there an approach to complete transposition of the colors so that the red became the largest field, followed by yellow, green, and blue. In none of the cases was marked amblyopia present, except in Case VII.; here the deficiency in visual acuity was due to a high grade of hypermetropic astigmatism and concomitant convergent squint.

We have had the opportunity of studying two cases of absolute hysterical hemianæsthesia, presenting the phenomena of crossed amblyopia. In one, a woman aged twenty-five years, seen by the courtesy of Dr. H. C. Wood, these symptoms appeared several months after the shock of a railroad accident. There was complete right-sided hemianæsthesia and loss of the special senses on the anæsthetic side, with amblyopia in so high a degree that quantitative light-perception was absent. The vision of the left eye was reduced to one-ninth of normal; red was the only color correctly appreciated, and there was left lateral hemianopsia.

In the other case, examined by the kindness of Dr. G. Oram Ring, who will publish the notes in detail, precisely the same conditions obtained, except that the amblyopia was less marked upon the anæsthetic side. In both of these cases the ophthalmoscopic appearances were normal.

If, as may fairly be supposed, these eight cases, taken at random from a large service, represent the ordinary conditions, then our conclusions as to the occurrence of achromatopsia with hemianæsthesia must be very different from those of the European observers. The patients were selected for study because they all presented greater or less degrees of loss or change of sensibility. As to this, it should be said that we can-

not find any statement by the French writers, who are the original students of this subject, concerning the relative frequency of hemianæsthesia in all hysterical cases, except statements like that of Dr. Bernutz, already quoted, that it is "one of the primordial symptoms," or Charcot's remark in exactly the same sense,¹ which would imply that it was present as an almost constant characteristic. Further, as to generalized anæsthesia, or, more properly, analgesia, Bernutz calls it "infinitely rare," and Charcot "relatively exceptional." The results of the ward-service as well as of the out-patient department of the Infirmary for Nervous Diseases would not allow us to make assertions which should corroborate these. These services may, we think, be considered to represent well at least the Eastern United States, as patients come from all of them to seek treatment, and our eight quoted cases are natives of several States—Pennsylvania, Wisconsin, New York, Virginia, and New Jersey. Every case differs in the *quality*, too, of the sense-changes, and some have that very curious symptom of ability to feel heat, when great, as pain, while they cannot appreciate a needle-thrust.

The only general conclusions which it does seem possible to draw are that general anæsthesia, infrequent though it be, cannot for this country be supposed so rare as in Europe; on the other hand, complete or nearly complete unilateral anæsthesia, while commonly present, is yet by no means so constant a feature of ordinary hysterical cases with us as with these foreign authors, and when either of these states is a symptom, it is certain that changes in the perception of colors are far less often to be found accompanying them than the study of the French and German writers would lead us to expect, and are practically absent in the cases of complete anæsthesia. Just as these observers see more often than we grave hysteria with convulsive seizures, hysteria, in the male and hysterio-epilepsy, so it would seem they find hemianæsthesia with achromatopsia more common. Some of their facts, as that mentioned by Landolt of the frequency of concentric contraction of the fields in such states, are as true for this country as for Europe.²

¹ Leçons sur les Localisations, etc., L. x. "In hysteria we have to do . . . with a unilateral anæsthesia. Total anæsthesia appears in relatively exceptional cases."

² Quoted by Charcot. See also the observations of Moravcsik in Laufenauer's clinic at Buda-Pest. Centralbl. f. Nervenheilkunde, 1887, p. 301.

THE USE OF OXYGEN IN THE TREATMENT OF LEUKÆMIA
AND GRAVE ANÆMIAS.

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THE treatment of the more serious forms of blood diseases is still so unsatisfactory that any addition to our means of counteracting them is deserving of record and careful scrutiny, and we offer these observations in the hope that others will be induced to try what we have found to be a potent agent. The changes in the blood in the cases observed were followed out in every detail, and the conclusions rest, therefore, not on impressions, but on actual minute inspection of the blood corpuscles.

CASE I.—G. B., æt. thirteen, had been subject to attacks of jaundice from infancy; the mother states that she believes the child had a number of malarial seizures, but was not certain. When first seen (February 5, 1889), the patient was pale, the conjunctivæ pearly and somewhat jaundiced. The spleen was enlarged, extending from the eighth rib to four finger-breadths below the margin of the ribs. The tumor had been noticeable for a year previous. For nearly two years the patient had spells of weakness, extending over a period of three weeks, and at intervals of two to three months. Occasionally hemorrhages from the nose occurred during this time, but never sufficient to cause alarm. His strength gradually failed, and he was discharged from his position as cash boy in a dry goods house, being unable to stand the work.

When first seen, the blood was examined and found to contain a sufficient excess of white corpuscles to warrant the diagnosis of splenic leukæmia. This view was substantiated by the fact of the white corpuscles steadily increasing in number, while the red diminished. February 5, 1889: The red numbered 2,350,000, the white 105,000 to the c.mm.; by May 20th the white corpuscles had increased to 320,000.

Having been on arsenic sometime previous to his first visit, the patient was given Basham's mixture and three grains of the extract of ergot three times daily, without, however, producing any effect upon the spleen. Galvanism was tried over the splenic region for two months without any improvement. Trinitrine was given at the same time, but the patient grew weaker under this treatment, and arsenic was again resorted to, though without amelioration.

On June 1st he began to inhale oxygen, and he improved rapidly under the treatment. He was given daily from twenty to thirty litres of oxygen, which was continued until August 5th. At this time the boy returned to work, much better than when he had left it. The blood was again examined September 2d, and found to be so near the normal that a count of the white corpuscles was considered unnecessary, the red being increased to 4,850,000, and one white found to about every four hundred red. The oxygen treatment was stopped.

Unfortunately, in this case, the early history could not be accurately determined; the mother's statements being very conflicting. But the great improvement spoke for itself—the boy is now steadily at work, and there is reduction even in the size of the spleen. The area of dulness begins fully one inch lower and one inch further to the left of the median line than when first seen.

The following case gives us a clear history; the patient being a man of intelligence and one who takes as much interest in the details of his case as those attending him :

CASE II.—S. L., æt. thirty-five; a man largely engaged in mining operations. Up to fifteen years of age he had enjoyed good health. The family history is excellent. In 1869, he lived in Iowa on the banks of the Mississippi River, a highly miasmatic region. Three years later, at the age of eighteen, he had an attack of malaria; the case was a severe one, lasting over a period of two years, during which time he was seldom free from the symptoms of the disease, and never escaped longer than one month without being confined to his bed. In 1874, he moved to a district among the Rocky Mountains, where he was entirely free from the outbreaks. Two years later, he had typhoid fever which confined him to his house for nine weeks. The convalescence was slow. In 1879, he had an attack of erysipelas lasting six weeks; convalescence here, too, was slow. Up to this time the patient had never weighed more than one hundred and fifty pounds; in the spring of 1880 he began rapidly increasing in weight, reaching, in a period of six months, two hundred and twenty pounds.

Although, for two years, at this period of life, the patient claims to have been in the best of health, a slight pallor of the skin was always present. He enjoyed, however, but two years of absolute freedom from ailment; for, in the spring of 1883, while suffering from jaundice, he began to lose flesh rapidly; in one month his weight was reduced to one hundred and ninety pounds. In the summer of the same year he had hemorrhages from the nose, the attacks lasting twenty-one days. The hemorrhages occurred daily, and were uncontrollable by any means other than plugging the nostrils; large doses of ergot and gallic acid were administered. After the hemorrhages ceased, his weight had diminished to one hundred and forty-four pounds.

In the autumn of 1883, a physician in Denver found that the spleen was enlarged; no examination of the blood, however, was made, and he was treated for "ague cake." Soon after this the patient went to Boston, where he had another attack of hemorrhage, lasting ten days. Up to this time he had gained ten pounds, but was soon reduced to one hundred and forty pounds. A trip to Europe was recommended, and there the patient in four months' time gained forty-four pounds. After leaving Europe he gradually lost weight. No hemorrhages have since occurred.

Since 1883 he had always suffered the inconvenience of an unquenchable thirst, the amount of liquids drunk being enormous—as high as twenty pitchers of ice water in the twenty-four hours; besides this, he imbibed a large amount of champagne, brandy, and other drinks. Concerning the early habits of the patient, they were anything but favorable to the success of any treatment. From the age of eighteen he had been

a heavy drinker, though never to intoxication; by his own statement he has taken in a day, without any effect other than exhilaration, two quarts of brandy, besides beer and wine. He has always been an inveterate smoker, and even at the present time does not find it easy to smoke less than nine cigars a day. Though a specific history in the case cannot be positively asserted as being negative, yet there have never been any symptoms of secondary infection.

Early in September the patient came to Philadelphia for treatment. When first seen he suffered from intense thirst and frequent micturition, passing large quantities of water, containing neither albumin nor sugar. The spleen was enormous; it passed nearly two inches beyond the umbilicus. There were profuse diarrhoea and great emaciation. Ergotine gr. ij t. d. was prescribed, followed by tartrate of iron and potassium, and that by the sulphate of iron. The ergot was continued more or less throughout the month of September, and, obeying strict directions, the stimulus was reduced to very moderate amounts. During this time the diabetes insipidus disappeared, and the patient drank but a pint of water in the twenty-four hours; the diarrhoea was arrested.

September 24th. Arsenite of soda, in gr. $\frac{1}{40}$ doses, was prescribed. Soon after this the patient went of his own accord to Hot Springs, Arkansas, but was advised there to return to Philadelphia, his case being considered non-specific. While at the Hot Springs he took the iodide of potassium gr. xv, t. d. This was continued until December 9th, being stopped on account of gastric irritation. At this time the spleen was outlined and found to extend an inch and a half to the right of the median line, and to fill completely the left abdominal cavity—from the lower border of the seventh rib above to the lower border in a line with Poupart's ligament. The blood contained 3,400,000 red and 62,000 white corpuscles to the c. mm.; hæmoglobin 60 per cent.

There was some improvement under the use of arsenic and Basham's mixture. But January 10th the patient was worse. Arsenite of soda, in doses from $\frac{1}{80}$ to $\frac{1}{25}$ of a grain, was taken at irregular intervals until June 27th, when it was discontinued, and the oxygen treatment begun. An examination of the blood at this time showed that the red corpuscles had diminished to 1,440,000, the leucocytes had increased to 1,120,000, a proportion of as 1:1 $\frac{1}{2}$. The patient had been in the West three months previous to this time. When he returned to Philadelphia it was found that the character of the disease had assumed a most serious type. His appearance was striking. The veins of the forehead were largely distended, and the capillaries plainly visible in many parts of the face, most prominent on the nose. The spleen was as large as ever, the abdomen greatly distended and tense, assuming a spherical shape. The knees were shaky; the feet were swollen, the swelling extending up as far as the knees. Shortness of breath was produced upon the slightest exertion; he always felt extreme fatigue. The spinal column was tender to the touch; the sitting posture produced severe pain in the bones of the ilium. A distinct anæmic murmur was heard over the base of the heart. Profuse watery discharges from the bowels had set in four days before his return, and still continued. He reported that he had been feverish for weeks, his temperature at that time (June 26th) being 102.3°; he was much depressed in spirits. He stated that, having himself made a careful study of the disease, he knew there was not the slightest hope for him. He was willing and

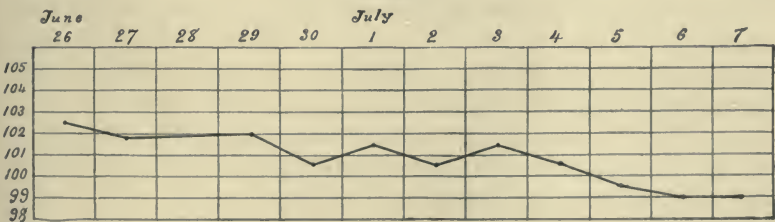
anxious that an experienced surgeon should attempt to remove the spleen, knowing that his chances were of the very slightest.

Beside the condition of the blood in regard to the relation of the corpuscles, it might be of interest to add that its color was opaque, it flowed freely from the puncture made by the lancet, and coagulated very slowly. Microscopically, the red blood-corpuscles were found to be widely separated, extremely pale, and at no time formed in rouleaux. The leucocytes varied in size and shape; some were small, others of enormous size, fully the one-five-hundredth of an inch in diameter; many were crescent-shaped as well as large, while others were shapeless.

After two days' inhalations of oxygen, the character of the blood was entirely changed; observed on the glass slide, the large and misshapen leucocytes had entirely disappeared, the red corpuscles formed rapidly in rouleaux, and the blood showed no abnormal character other than the relation of the white and red corpuscles.

From June 27th to July 3d the patient took nothing beside the oxygen, except a mild hypnotic upon retiring. Ten litres, three times a day, were inhaled. The oxygen was perfectly pure, and was allowed to pass through water, to prevent dryness of the throat. The effect at the end of the week was marked; the swelling of the feet was scarcely perceptible; the appetite was good; the bone pains had almost entirely disappeared; the temperature had steadily fallen, and the patient walked about with comparative ease. The number of white corpuscles had diminished nearly one-half, while the red had gained a million. During the second week the patient was given Basham's mixture, but it did not suit him, and at the end of the week it was discontinued. In the third week of the treatment the most marked improvement took place in the general condition. The fever disappeared entirely; there was no swelling of the feet; the prominent veins on the forehead and the capillaries visible on the face had almost completely passed from view; the appetite increased; there was shortness of breath only on violent exertion, and the patient was but little inconvenienced by walking a mile. By the end of the fourth week he had gained nine pounds.

CHART.



Temperature from Wednesday, June 26, to July 7, 1889. Oxygen commenced in the morning of July 27th. Temperature taken 3 P.M. After July 7th the thermometer at no time registered over 100°.

From this time the improvement was steady until August 20th, when, by some indiscretion in diet, aided greatly by a few bottles of champagne, together with the atmosphere of Boston, which did not suit him, he began to fail. The white corpuscles increased in number, the red slightly diminished.

August 26th, he returned to Philadelphia, since which time he has rapidly gained in strength, and is now on a visit in Colorado, having stood the trip very well. Not long before he left, the spleen was carefully percussed, and presented a marked reduction in size, the transverse diameter extending only to three-quarters of an inch of the median line near the umbilicus. A telegram from Denver of September 20th records: spleen going down, blood in excellent condition, hæmoglobin up, appetite excellent.

An ophthalmological examination made August 29th, by Dr. Gould, showed a noteworthy absence of several of the typical signs of leucæmic retinitis as described by Liebreich, Becker, Leber, and others. Dr. Gould regretted that he had no opportunity to make an examination at an earlier stage of the disease when the proportions of the red and white corpuscles were so abnormal. There is in both eyes a grayish haze that suffuses the central part of the fundus, especially about the papilla, in semi-obscurity. This gradually clears until at about 50° the details of the periphery are normally clear. But this discoloration is not yellow, nor has it an orange tint. The veins are highly distended and engorged, but only slightly tortuous; the arteries of subnormal size, often thread-like; the light-streaks of the centre well preserved; the color of the blood is pale, but not excessively so. No white bands of extravasated corpuscles follow the vessels, and the white dots or splotches usually described are not to be seen about the macula or periphery, and no remains of hemorrhages are to be found. The existence of a typical tobacco papilla is very noticeable. The visual acuity is good, full $\frac{20}{xx}$ with either eye, despite a slight hyperopic astigmatism.

During the course of treatment the oxygen was steadily increased to sixty litres in the twenty-four hours, and now one hundred litres a day are inhaled; the patient having sent by express nearly a thousand gallons to Colorado. It was at first thought best to administer the oxygen so that it be taken at three sittings, this was changed to two sittings in the twenty-four hours. Throughout the treatment no unpleasant symptoms attended the use of the oxygen. An exhilarating effect, at least, was looked for, and it was expected that such large doses would produce some action upon the heart, but a sense of freedom felt about the chest after the inhalation was the only effect noticed.

During the treatment of these cases of leukæmia, two cases of chlorosis were given inhalations of oxygen, as an adjunct to the use of iron. These are brief records of them.

CASE III.—A. M., æt. seventeen, school-girl. In the early spring she began to feel weak, and suffered considerably from headache. Her menses at that time were scant, and disappeared entirely during the months of April and May. For six months previous to this she had been pale. On June 8th, the patient was extremely pale, the conjunctivæ pearly, there was but little color to the lips. The blood was examined, and found to contain but 25 per cent. of hæmoglobin, the red blood-corpuscles numbering 3,800,000 to the c. mm.; white corpuscles one to every four hundred and eighty red. The sulphate of iron in

increasing doses was prescribed, with daily inhalations of from twenty to thirty litres of oxygen. In two weeks time there was marked improvement. June 24th the menses reappeared, though scant.

By July 1st her color had returned. An examination of the blood showed the hæmoglobin to be 90 per cent., the red corpuscles numbering 4,850,000 to the c. mm. White corpuscles one to every six hundred red.

CASE IV.—R. E., æt. twenty-three, teacher. Menses irregular and scant for a number of months. She suffered much from headache. For the past three months she has been very pale. There was considerable shortness of breath. A large eczematous patch covered most of the chin. Examination of the blood showed the hæmoglobin to be but 30 per cent. of the normal, the red corpuscles numbering 5,000,000 and the white normal. She was given the sulphate of iron in increasing doses, and inhalations of from twenty to thirty litres of oxygen a day. To the eczema an ointment of ten grains of resorcine to an ounce of ointment of oxide of zinc, was applied at night. July 24th, the general health was much improved, and the hæmoglobin found to be 45 per cent. The iron pills and the oxygen were continued.

August 2d. Menses were about normal, the hæmoglobin 60 per cent. The patient was again seen August 28th. She had discontinued the oxygen on August 8th, and took no medicine after August 12th, the eczematous patch having disappeared. She was still somewhat pale; the hæmoglobin was found to be 75 per cent. The pills were renewed, oxygen was resumed, and pepsine and hydrochloric acid were taken after meals. September 8th, her color was normal and the hæmoglobin found to be 90 per cent., the patient feeling strong and hearty.

Of the value of the oxygen in these severe cases of anæmia there can be no doubt, though they were of a character in which it is likely that other treatment long persisted in would also have been beneficial. But certainly a curative effect would not so soon have been accomplished without the oxygen. With these results in mind, it is natural that we should have been anxiously waiting to observe its effects in a case of undoubted pernicious anæmia. Such a case is now in our hands, in which the first examination showed only 900,000 red corpuscles, and the second, in about a week afterward, 700,000; the hæmoglobin at both being 25 per cent. The patient is weak to the verge of utter exhaustion. We have begun the oxygen treatment, but have not as yet used it long enough to judge of its merits.

But to return to what we have been studying in the first group of cases—to the leukæmic condition and the changes wrought in it. That these were made through altering the blood seems certain. With its alteration, the nervous system recovered from its depressions, the mind improved, flesh and strength were gained, the secretions became healthier, and all this took place rapidly, and in cases in which iron and arsenic had failed to stay the downward course. The effect on the spleen was less evident, for the organ, though decreased, remained very large in both.

It may be of interest to compare the results of the treatment with

some instances of the disease in which blood counts were made while other remedies were employed. In Mr. Barton's well-known case,¹ in which for four months large doses of arsenic were taken, the dose reaching twenty-five minims of the liquor arsenicalis six times a day, there was a most striking improvement. The white corpuscles were greatly reduced, but there was but little increase in the red. We have made blood counts in cases treated with phosphorus, and in cases treated with arsenic. In one with phosphorus persisted in for three weeks in decided doses, two observations on the blood showed no improvement, and the patient was lost sight of. Arsenic we have often employed and made frequent examinations of the blood during its use. We append one followed to the end, drawn up for convenience' sake in tabular form.

THE CASE OF H. R., TREATED MAINLY BY ARSENIC.

	Number of red corpuscles to the c.mm.	Number of white corpuscles to the c.mm.	Per cent. of hæmo- globin.	The proportion of red to white corpuscles.
June 12, 1888.	2,830,000	145,000	40	1 : 20
" 26,	2,800,000	103,200	40	1 : 27
July 9,	2,915,000	108,000	45	1 : 27
" 16,	2,500,000	95,000	30	1 : 25
" 30,	2,405,000	90,000	35	1 : 27
Aug. 12,	2,365,000	205,000	20	1 : 11+
" 21,	2,160,000	300,000	30	1 : 7+
" 30,	2,050,000	368,000	25	1 : 5+
Sept. 15,	1,950,000	400,000	25	1 : 4+
" 25,	1,760,000	950,000	20	1 : 1+
Oct. 18,	1,570,000	1,000,000	20	1 : 1+
" 29,	1,240,000	1,938,000	15	1 : 0.5+
Nov. 5,	1,120,000	2,560,000	10	1 : 0.5

The following shows the line of treatment in the case of H. R.:

June 12th to July 1st. Quinine sulph. grs. v, t. d., ext. of ergot. grs. v, t. d.

July 1st to Sept. 26th. Stomach irritable. Ergot discontinued, liq. Fowleri \mathfrak{m} iv, increased gradually to \mathfrak{m} xx, t. d., discontinued only when stomach became irritable.

The patient died November 29, 1888. Post-mortem examination: Spleen weighed eight pounds, the liver six and a half. Kidneys contracted. Inflamed condition of the alimentary canal and peritoneum. Mesenteric glands enlarged. Fatty and dilated heart. Pleural adhesions. Slight broncho-pneumonia. Anasarca.

For purposes of comparison we append, at the risk of some repetition, the results in tabular form, with reference to the blood and its change by the oxygen treatment, in the two cases of leukæmia detailed at the beginning of the paper. The increase of red as well as the diminution of the white corpuscles is very obvious.

¹ Year book of Treatment, 1889.

THE CASE OF G. B., SHOWING THE RELATION OF THE RED AND WHITE CORPUSCLES BEFORE AND AFTER THE INHALATIONS OF OXYGEN.

		Number of red corpuscles to the c.mm.	Number of white corpuscles to the c.mm.	Per cent. of hæmo- globin.	The proportion of red to white corpuscles.
Feb.	5, 1889.	2,350,000	105,000	20	1 : 22
April	10,	2,860,000	120,000	25	1 : 24
May	12,	2,650,000	300,000	20	1 : 8
"	20,	2,550,000	320,000	15	1 : 8
June	10,	3,000,000	165,000	20	1 : 12
"	23,	2,675,000	160,000	—	1 : 16
"	28,	3,500,000	17,500	—	1 : 200
July	5,	3,800,000	17,277	30	1 : 220
"	10,	4,000,000	10,650	—	1 : 380
"	16,	4,300,000	13,300	45	1 : 323
"	29,	4,520,000	14,000	65	1 : 323
Sept.	1,	4,850,000	—	—	1 : 400

The following shows the line of treatment in the case of G. B.:

February 5th to 23d. Basham's mix. $\bar{3}$ ss, t. d.; ext. of ergot. grs. iij, t. d.

February 23d to May 25th. Trinitrine gtt. i-v, t. d.; quinine grs. iij, t. d.; galvanism.

June 1st to July 29th. From 20 to 30 litres of oxygen a day; no other treatment.

During the month of August the sulphate of iron was prescribed.

THE CASE OF S. L., SHOWING THE RELATION OF THE RED AND WHITE CORPUSCLES BEFORE AND AFTER THE INHALATIONS OF OXYGEN.

		Number of red corpuscles to the c.mm.	Number of white corpuscles to the c.mm.	Per cent. of hæmo- globin.	The proportion of red to white corpuscles.
Dec.	9, 1888.	3,600,000	65,000	70	1 : 55
Jan.	5, 1889.	3,200,000	200,000	60	1 : 16
Feb.	5,	2,600,000	450,000	45	1 : $5\frac{7}{8}$
June	26,	1,440,000	1,120,000	25	1 : $1\frac{1}{4}$
July	3,	2,408,000	584,000	35	1 : $4\frac{1}{4}$
"	10,	2,140,000	560,000	35	1 : 4
"	17,	2,292,000	358,000	40	1 : $6\frac{1}{2}$
"	24,	2,484,000	320,000	—	1 : 8
"	31,	2,792,680	167,320	—	1 : 17+
Aug.	18,	4,614,200	165,800	60	1 : 30
"	27,	3,440,000	320,000	—	1 : 14
Sept.	1,	4,658,000	142,000	65	1 : 32+

The following is the treatment carried out in the case of S. L.:

Dec. 9, 1888, to Jan. 5, 1889. Potassium iod. grs. xv, t. d.; sulphate of iron.

Jan. 10th to June 26th. Arsenite of soda gr. $\frac{1}{40}$ — $\frac{1}{25}$, t. d.; iron discontinued.

June 27th to July 3d. 30 litres oxygen daily.

July 3d to 10th. 45 litres oxygen daily; Basham's mix. $\bar{3}$ ss, t. d.

July 10th to Aug. 14th. 54 litres oxygen daily.

Aug. 14th to 22d. 54 litres oxygen daily; sod. arsenite gr. $\frac{1}{30}$, t. d.

Aug. 22d to Sept. 1st. 60 litres oxygen daily; arsenic discontinued.

After Sept. 1st. 100 litres oxygen daily.

We are not aware that oxygen has been systematically used in serious blood affections. The only case of its employ we can find recorded is the one of leukæmia reported by Sticker.¹ The examination of blood showed the red corpuscles decreased to 30 per cent., the white corpuscles numbering 3,735,000; a proportion of white to red of 1:0.5. From May 5th to August 22d the patient took daily inhalations of oxygen, commencing with thirty litres, which was finally increased to sixty litres a day. August 22d the red corpuscles numbered 4,460,000, the white 33,200; the patient, after a relapse in which the administration of oxygen had no effect, died the following January.

The mode of action of oxygen is not fully known. We have here a field in which the therapeutic powers of this gas may be, by continued observation, ascertained. Sticker has suggested that the white corpuscles absorb oxygen, and use it up in the blood, and this at the expense of the red corpuscles, and that the administration of the gas might be expected to restore the normal condition, as well as to aid in the conversion of white into red corpuscles.

In all cases of leukæmia there is always found an impairment of some one or more of the blood-making organs, due at times to a known cause, at others to an unknown one. In Case II. the history is that of decided disease of the spleen, long before the blood became markedly affected. It was not until the functioning power of the spleen was seriously diminished that the blood gave signs of leukæmia, and as it became more and more impaired by the overgrowth and distention of the diseased organ, the red corpuscles diminished and the white increased. We had then, it seems, in the action of oxygen, a substitution for the function of the spleen. We did in both these cases, artificially, what the damaged organ could not perform—we allowed the metamorphosis of the white corpuscles into red to go on. The hope in benefiting the patient is to keep up this substitution until the lesion is influenced by the improved nutrition, aided by other means; or, in appropriate cases, until the system is so far built up to make surgical interference a procedure much more likely to succeed than it does now. Whether permanent effects follow this oxygen treatment, or mere temporary benefit and prolongation of life, we cannot as yet say. In cases in which the structural changes are still slight, we believe the remedy may bring about a permanent change; in more advanced cases this is more doubtful. But, under any circumstances, that it prolongs life and produces results not to be otherwise obtained, our experience enables us to affirm.

¹ Beiträge zur Pathologie und Therapie der Leukæmia. Zeitschr. f. klin. Med., Bd. 14, Heft. 1, 2, 1888.

SOME MANIFESTATIONS OF LITHÆMIA IN THE
UPPER AIR-PASSAGES.¹

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THE influence of lithæmia and allied conditions upon the mucous membrane of the upper air-passages appears in a general way to be recognized by the profession, but an examination of the *Index-Catalogue* of the Surgeon-General's Library fails to show any indication of this recognition by title or reference. Harrison Allen,² in the past year, has reported five cases of gouty sore throat, with a description of the general characteristics of such cases. His brief *résumé* of the literature extant upon the subject shows that it has received slight consideration in laryngology. That the existence of an influence so obvious in its effects upon the upper air-passages in a limited class of cases should have escaped more detailed description in laryngological text-books and in current literature, is apparently due to the great advance made in recent years in improved methods of topical application and to the increased interest in nasal surgical pathology and the greater appreciation of its influence upon laryngeal disease, which have led to a, perhaps, too strictly local and surgical view of some diseased conditions of this region.

In addition to the sore throat found in distinctly gouty subjects, described by Allen,³ there is a less well-defined form of inflammation—of which his second case appears to be an example—that presents certain appearances and symptoms, which, while not at all pathognomonic, yet taken with the history and general symptoms, and above all with the results of general therapeutics, are indicative of its dependence upon a lithæmic or allied condition. These local manifestations of lithæmia are of necessity not clearly definable, for the general condition upon which they supervene is one of whose underlying pathological conditions we know but little. The term lithæmia, tentative in character, is based solely upon clinical manifestations and is applied with considerable latitude of meaning. Some even speak of an acute so-called "bilious attack" as an attack of lithæmia. The term is here used to express the now well-recognized conditions to which Murchison⁴ applied the name—not to conditions brought about in an individual with fairly normal digestive and assimilative functions by temporary excess, or even by constant irregularities of diet of a gross character, but to that condition of suboxidation and overcharging of the blood and excretions with excretory matter in a state of faulty elaboration due to inherent and hereditary abnormality of function or to prolonged exposure to depress-

¹ Read before the eleventh annual Congress of the American Laryngological Association, 1889.

² Medical News, June 16, 1888.

³ Loc. cit.

⁴ Clinical Lectures on Diseases of the Liver.

ing environment. As S. Solis-Cohen well says in a recent article on the "Therapeutics of the Gouty Diathesis:"¹ "It is not a disease—not a sudden or gradual departure from the usually normal action of the organism—that we are dealing with; but it is, if I may be permitted the expression, an abnormal normality; that is to say, an inherent departure of the individual organism from the typical action of like organisms."

Individuals of this diathesis are prone to digestive disturbance from the most ordinary articles of diet, particularly the starches and sugars and acid fruits. Simple and regular habits of diet are not sufficient to prevent recurring exacerbations of the characteristic symptoms, if unusual mental or nervous strain is undergone in a sedentary pursuit. There is the tendency to form uric acid in excess, from which the condition is named, and to a waste of phosphates—conditions most easily detected in the urine—along with digestive, mental, and nervous phenomena of depression familiar to you all. While this condition is found in individuals of gouty antecedents, or of distinctly gouty tendencies, so that the term lithæmia or the gouty diathesis may be used interchangeably to describe it in some cases, yet in other cases its subjects may never have true gout, or even distinct irregular manifestations of it. Indeed, under the environment of most Americans, the development of local attacks of gout is rare, while the nervous and digestive derangements under consideration are not unusual. From this it appears that a distinction must be drawn, as pointed out by Allen,² between cases of gouty sore throat—where the throat lesions accompany or follow distinctly local manifestations of gout in other parts of the body—and cases in which with no distinct personal or family history of gout, there are throat symptoms referable to a general lithæmic or allied condition, and relieved by treatment directed against such condition.

I have qualified with the words "or allied condition" the definition of these cases as lithæmic, because the term is of necessity somewhat vague and elastic in its application to conditions that vary from typical and unmistakable clinical manifestations to almost normal health. It includes many cases of "muscular rheumatism," so-called, and the tendency to the affections of fibrous structures seen in sufferers from torticollis, lumbago, etc., is more allied to lithiasis than to the acute affection from which it borrows its name. The same may be said of certain forms of chronic rheumatic sore throat described by Ingals.³ Some of his cases appear to me as expressions of a lithic rather than a true rheumatic state.

The manifestations of lithæmia in the upper air-passages do not fall uniformly under any one type, nor are they sharply distinguished as being of lithæmic origin by the local conditions they present; but there are certain appearances or symptoms that are more or less constantly

¹ Medical News, May 18, 1889.

² Loc cit.

³ AMER. JOURN. MED. SCI., Jan. 1888.

connected with lithiasis, and at least suggest the presence of that element and the need of general therapeusis on that line, whatever local measures may be indicated.

An appearance occasionally seen in cases of irritable throat associated with lithæmia is a patchy congestion of the laryngeal face of the epiglottis extending along the aryepiglottic folds and over the posterior aspect of the ventricular bands. This is associated with a harsh, dry, explosive cough, and sense of extreme irritation about the larynx. My friend, Dr. Roswell Park, has informed that he has seen with the cystoscope the same patchy congestion of the mucous membrane of the bladder in a case of inflammation of that organ in a markedly lithæmic subject.

A case illustrating this form of laryngitis, associated with lithæmia, is the following:

Male, aged about thirty-eight years, of sedentary habits. Is subject to attacks of constant, irritable, and explosive cough, with some impairment of strength of voice. The attack at time of first consultation had lasted about one week. Laryngoscopic examination showed irregular patches of deep congestion on the margins of the epiglottis and on its laryngeal surface. The upper larynx generally showed more congestion than in the plane of the glottis. Warm aromatic inhalations and subsequently mild astringent sprays failed to give material relief. A solution of sulphate of zinc or of nitrate of silver, of a strength usually non-irritant, caused much discomfort and aggravated the symptoms. A urinary examination showed high acidity, with uric acid and oxalate of lime in excess. He informed me that he was accustomed to take alkalis at intervals, by medical advice. The administration of alkalis and antifermentatives, with regulation of the diet and the inhalation of diluted lime-water, gave prompt relief.

The extreme sensitiveness of the mucous membrane to astringent or stimulant applications here noted is common to these cases, as mentioned by Allen concerning gouty sore throat. I regard it as a point of diagnostic significance, suggesting a careful examination as to the presence of a lithic diathesis.

A similar form of patchy inflammation of the pharynx is seen in some cases, the congestion extending in streaks usually along the posterolateral walls. It is accompanied by an ill-defined sensation of "sore throat," with, perhaps, some laryngeal irritation. A sense of uneasiness, or even positive pain on swallowing, is at times referred to one or other side of the larynx externally—often opposite the superior cornu of the thyroid, as noted by Ingals.¹ This referred sensation occurs more often, in my experience, from inflammation of the pharynx or peritonsillar region than from inflammation of the laryngeal mucous membrane. A case in point is the following:

Mrs. G., aged about thirty-five years, subject to sore throat, referred especially to the sides of the throat, with occasional darting pains into

¹ Loc. cit.

one or other ear. There is some dry and painful cough; no marked pharyngeal secretion. The lateral walls of the pharynx present deep congestion, extending above the free margin of the soft palate and below the plane of the superior margin of the epiglottis. The median posterior wall of the pharynx is but slightly congested. Her attacks are preceded and accompanied by muscular lameness, especially in the muscles of the neck and upper back. Gentle pressure upon the regions of lateral congestion causes them to swell slightly and produces pain darting into the ear and lower pharynx. There is a history of an attack of acute rheumatism in one member of her family. The urine is scanty and high-colored. She is subject to headache, indisposed to exercise, feels often heavy and dull, lives upon rich diet. Stimulating applications cause distress and aggravate the symptoms. She has improved much by regulation of diet, exercise, and the administration of alkalies and antifermentatives. She has frequent relapses, owing to her unwillingness to regulate her habits as directed. These exacerbations are improved by general antilithic medication more than by any local treatment applied.

I have noted a few cases in individuals of lithæmic tendencies, in which their lithic storms were accompanied by marked naso-pharyngeal catarrh, not present in any appreciable degree during the intervals. This symptom is noticed for several days before the digestive and other derangements make themselves manifest. In one case, it is so marked that the appearance of the pharyngeal catarrh is regarded as a signal for appropriate general medication and hygiene, with the effect of checking both the catarrh and the general attack. In these cases the use of the various solutions of iodine is extremely irritant, and all stimulant applications are ill-received.

I have observed a condition of obstinate relaxation of the venous plexus of the turbinated bodies in some individuals coincident with general indisposition of a lithæmic character, and apparently dependent upon it. Caustic applications are badly borne, and fail to accomplish their desired effect on account of too great inflammatory reaction. The use of soothing local applications, and diluents and alkalies internally, with general hygiene, gives improvement in some cases. In others, the time of year marked by damp, cold winds invariably finds them from time to time attacked by symptoms of inflammation and occlusion of the nasal chambers, not necessarily severe, but sufficient to annoy. This resistance to local measures I have been led to attribute, in some cases, to intractable lithæmic tendencies.

In conclusion, I desire to repeat what has been stated above, that the manifestations of lithæmia here described are not regarded as typical; but they have been found associated so often with more or less pronounced lithæmic or allied conditions, and so responsive to therapeutics adapted to this state, that their presence should at least lead to a careful examination of the personal and family history and general condition, to discover what influence lithiasis may have in the case under consideration.

REVIEWS.

A TREATISE ON SURGERY—ITS PRINCIPLES AND PRACTICE. By T. HOLMES, M. A. Cantab., Consulting Surgeon to St. George's Hospital, Membre Associé de la Soc. de Chirurg. de Paris. With four hundred and twenty-eight Illustrations. Fifth edition. Edited by T. Pickering Pick, Senior Surgeon to and Lecturer on Surgery at St. George's Hospital, etc., etc. 8vo., pp. 1008. Philadelphia: Lea Brothers & Co., 1889.

No better proof of the value of Holmes's Surgery as a text-book could be adduced than the fact that it has passed through four editions, and that a fifth is now presented to the medical profession for its favorable consideration. Surgery has made such giant strides in the past fifteen years that it is necessary for an author to be always on the alert, as his book is hardly out of the press before a revision becomes imperative. Our knowledge of to-day may be proven error to-morrow; and what has appeared to be enshrouded in Cimmerian darkness at the present, may be illuminated with the light of discovered truth in the near future. The position, then, of a surgical author or editor must be that of constant literary activity. Surgery is ever progressive and aggressive, and new fields are being daily wrested from the domain of general medicine. Every new edition of a treatise upon surgery must, therefore, cover more ground than its predecessor.

In the fifth edition of this work extensive alterations have become necessary in the chapters on inflammation, wounds, tumors, diseases of the bones and joints, abdominal and cerebral surgery. The present is the epoch of microorganisms, and the rôle which they play in surgical affections is freely recognized in this treatise.

We have gone over the present edition somewhat carefully, and have noted casually some of its peculiarities, merits and defects; for instance, the author's classification of wound healing is very simple, but scarcely one to be adopted in this day of antiseptic surgery. His two classes of repair are those which heal with suppuration and those which heal without. The presence or absence of suppuration is too much of an accident to be made the basis of a classification. The older classification is, however, given sufficient notice. Traumatic fever is not considered to be dependent upon the absorption of putrefactive elements, but to the letting loose and subsequent reabsorption of the free fibrin ferment; a view which seems to the reviewer much more tenable than that which makes it a mild form of septicæmia. The wound fevers which come on later are classified as: sapræmia, or septic intoxication, due to the absorption of ptomaines; septicæmia or true septic infection, dependent upon the action of pathogenic germs; and pyæmia, or septic infection with the addition of metastatic abscesses. We are rather surprised that no mention is made of the dependence of suppuration upon the presence of

microorganisms, as the pathologists tell us there can be no pus formations without the entrance of germs. Recent investigations have conclusively proven that tetanus is also a germ disease, but this fact receives no mention by our author. Estlander's operation of resection of the ribs for chronic empyema is mentioned, but without much commendation, which seems to be a little unjust, as numerous cures have been effected by this method, in otherwise incurable cases.

In the treatment of the various intra-abdominal troubles, the author takes a rather conservative position, but laparotomy is recommended without delay in rupture of the bowels and acute intestinal obstruction. The experimental work of Senn, in regard to intestinal obstruction, his intestinal anastomosis, bone-plate suture, rectal insufflation of hydrogen gas for the detection of perforations of the intestines, receives no mention. In fact, this section seems to us to be about two years behind the times.

Kocher's method of reducing dislocations of the shoulder is regarded as the best in use—a view which is quite in accordance with our own. In speaking of the suturing of recent fractures of the patella Mr. Holmes says: "I would not consent to have this operation performed on myself, and I do not, therefore, feel justified in recommending it to my patients."

The complications of gonorrhœa are stated to be rare in females, and no mention is made of gonorrhœal salpingitis, pus tubes, and the like, which occupy such a prominent place in recent gynecological literature. We think it has been pretty conclusively proven that the complications of gonorrhœa are both frequent and very serious in women. Bichloride of mercury injections for the cure of gonorrhœa are not mentioned.

Cerebral surgery is only briefly considered, scarcely as much as the importance of the subject would demand, and the same might be said in regard to the operations upon the stomach. A very timely warning is given against applying too great violence in taxis for the reduction of strangulated hernia. The danger is a real one. Wood's method of radical cure of hernia is quite voluminously described, whilst Macewen's and McBurney's operations have been entirely overlooked.

On the whole the fifth edition of Holmes's *Principles and Practice of Surgery* is conservative in tone—perhaps a little too much so—and is just a little behind the most advanced surgical thought, but as surgery is progressing so rapidly these little omissions are, perhaps, of not very serious import. The volume can be conscientiously recommended as a capital text-book for students and general practitioners. R. W.

THE MECHANISM OF THE CIRCULATION OF THE BLOOD THROUGH ORGANICALLY DISEASED HEARTS. By HERBERT DAVIES, M.D., F.R.C.P., late Consulting Physician to the London Hospital, and formerly Fellow of Queen's College, Cambridge. Edited by ARTHUR TEMPLER DAVIES, B.A. (Natural Science Honors), M.B. (Cantab.), M.R.C.P., Physician to the Royal Hospital for Diseases of the Chest, etc. Small 8vo., pp. vi., 64. London: H. K. Lewis, 1889.

"ONLY those who were intimately acquainted with my father," says the editor of this valuable little book, "are aware of the infinite care and

trouble he bestowed upon his writings. He never drew any conclusions without most carefully and assiduously verifying the absolute correctness and soundness of his facts." Thus we have before us in clear and convincing statement, an admirable series of studies of conditions not so well understood from the physical or mechanical side as they ought to be; the whole comprised in some three score short papers.

Within recent years, with more extended experience upon the part of a generation trained from the first in physical diagnosis, the gravity of the prognosis in valvular affections of the heart has been greatly modified. We have learned, as Da Costa has recently set forth with so much clearness, to look more to the condition of the heart-muscle, and to the manner in which the balance of the circulation is maintained, than to the particular valve affected or the nature of the lesion. In line with this experience, explaining it, and giving a rational basis for forecast as for treatment, are the studies of Dr. Davies here collected and published in connected form. As set forth in the author's communication to the Royal Society in 1870, by studying the normal circulation we discover that it obeys two fundamental laws: 1. The corresponding chambers of the right and left hearts receive and expel their contents exactly synchronously; ventricle acting in unison with ventricle, and auricle in unison with auricle. 2. Equal volumes of blood pass in equal and the same times through any two corresponding orifices of the heart.

As the two ventricles, acting with unequal forces, send forth equal quantities of blood synchronously, the areas of the pulmonic and aortic orifices must be inversely as the velocity of the currents which traverse them. The two ventricles must likewise receive in the same time equal quantities of blood, and in such a manner that the momentum of pressure of the incoming current is proportional to the inertia of the ventricle which it has to overcome. Thus, the areas of the tricuspid and mitral orifices are also inversely as the velocities of the incoming currents. The force of each ventricle is such as to give its expelled current the proper velocity, to maintain completely the pulmonic and systemic circulations. These objects must be secured within certain limits of deviation, the large veins and right auricle on one side, the pulmonary vessels and left auricle on the other side, being compensatory receptacula. By actual inspection we find in agreement with theoretic requirement, that the ratio of the area of the tricuspid orifice to the area of the mitral orifice, equals 1.3 to 1.4, and that the same ratio holds between the pulmonic and the aortic orifices.

There is also a necessary correlation of respiratory with cardiac activity. If, by reason of unduly prolonged exertion, the heart be stimulated to contract at a speed which the respiratory muscles cannot well maintain, the time allowed for the introduction of air, and also for the chemical change of each charge of blood, being insufficient, a portion of each charge of blood from the right ventricle will remain for a time unaërated, and retained in the pulmonary vessels, and, possibly, in the right ventricle itself. According to the degree of the discrepancy thus caused between the volumes of blood passing through the two sides of the heart respectively, will be the degree of dyspnoea developed. A case of a professional runner is cited, in which this interference with normal mechanism finally led to dilatation and softening of the right heart.

In studying the circulation through hearts in which there is either obstruction or valvular insufficiency at one or more of the orifices, these

three factors are to be considered : synchronous action and equal efflux of blood, upon the part of the corresponding chambers : and sufficiency of aëration. Disturbances may arise from alterations in the proportional areas of similar or of complementary orifices, or merely from diminution of the quantity of blood effectively propelled through a certain orifice. Increased velocity on the one hand, or diminished velocity on the other, may be required to restore the normal harmony ; and this again has to be brought about by increase or diminution in the contractile force or capacity of the affected chambers ; or of the rate of cardiac contractions.

The author reviews, in detail, the means by which, in the various forms of valvular disease, compensation may be effected through dilatation or hypertrophy, or both, of one or more of the cardiac chambers, with or without alteration of the pulse-rate, so that for a greater or longer period the three necessary factors may be secured. It is impossible within our limits to summarize his conclusions, many of which are not yet parts of our general knowledge. The original papers should be read.

S. S. C.

ON CANCER OF THE UTERUS; BEING THE HARVEIAN LECTURES FOR 1886.

By JOHN WILLIAMS, M.D., F.R.C.P., Professor of Midwifery in University College, London, etc. With plates. 8vo., pp. 119. London: H. K. Lewis, 1889.

THIS is not a treatise, but a series of lectures, as the title indicates, and the character of the author and the work which he has done always entitle him to a respectful consideration. We should expect from him more or less that is original, even on such a subject as cancer, and a decided leaning to the pathological, rather than to the clinical, side of his subject, and in this we are not disappointed. The work is, in short, an analysis of thirty cases representing cancer of the portio vaginalis, the cervix, and the body of the uterus, this being the form of classification which is adopted, and such deductions as would result from such analysis. The cases are beautifully illustrated by eighteen plates, which form as fine a series for the study of cancer as could be desired. Not much is said in regard to etiology, but a great deal concerning pathology. Surgical treatment is advocated, the earlier the better, a positive opinion backed by reasonable statistics being advanced as to the propriety of the supra-vaginal operation for the first two mentioned varieties, and total extirpation per vaginam for cancer of the body.

Considering the insidious manner in which the disease progresses, there is reason for the author's statement that future knowledge concerning it will come largely from pathological rather than clinical investigations. We quite agree with him in regard to the meaningless character of the time-worn terms scirrhus, medullary, and encephaloid, in relation to this disease, and that the only correct classification is the anatomical one, but that for clinical purposes the terms *hard* and *soft* may be used, according as a case presents slow growth and abundance of fibrous tissue, or the reverse. We are quite willing to concede the value of the investigations of Ruge and Veit on this subject, which, however, have not been entirely acquiesced in by the author of this book and others ; but if their work marked an epoch in the knowledge of this disease, what can be said of

the precedent work of Billroth, Thiersch, and Waldeyer, especially the latter, who has established the doctrine of the epithelial character of cancer.

Any one who has ever seen much of this disease will appreciate the author's statement that it is difficult to trace its life-history, first, because it is rarely observed early enough to distinguish its first stages; second, because when cases are examined early their true nature is overlooked. There are many reasons why the first stages of cancer should remain obscure. During this stage there are few symptoms of importance, and the average woman does not care to be examined at regular intervals to see whether anything of the kind is developing. The significance of the ordinary erosion of the cervix, as shown by Ruge and Veit, is little appreciated by the majority of gynecologists, and as the clinician, rather than the pathologist, usually sees these cases in their early stage—if they are seen at all—the chances are not very favorable for revolutionary changes at present. Still, the watchman's duty is to sound the alarm, and it has been faithfully sounded in this case, and we heartily wish that every case of eroded or abraded os externum might be subjected to the judgment of the microscope.

Again, there is a class of cases even less suspicious than those in which there is erosion or adenoma, cases which Williams has described as cancer of the cervix—that is, of the glands of the cervical mucous membrane, in which in their early stages there is almost nothing to excite suspicion. The epithelium of the portio vaginalis and of the os is unchanged, and not until considerable headway has been made does the patient become aware that she has a fatal disease. The pathologist is as helpless as the clinician for such cases, and they are not infrequent.

The author entirely rejects the idea that lacerations of the cervix favor the development of cancer; in fact, in cases which he studied, other portions were invaded, and the cicatrix of the cervix was spared, or not involved until late in the disease. We do not feel willing to accept his argument as yet; his cases are too few for the generalizations which he makes, and the bad nutrition of many cases in which the cervix has been lacerated certainly favors the possibility of neoplastic developments. The author's tendency to generalize from insufficient data is seen in some other statements which he has made, and for one who is usually so careful and precise, it would almost seem as if he had departed from his custom in being a little hasty in his conclusions. A. F. C.

UEBER ELECTROLYTISCHE OPERATIONEN IN DEN OBEREN LUFTWEGEN.
Von DR. R. K. KAFEMANN.

ON ELECTROLYTIC OPERATIONS IN THE UPPER AIR-PASSAGES. By DR.
R. KAFEMANN. Pamphlet 8vo., pp. 16. Wiesbaden, 1889.

THIS is a lecture delivered before the Verein für Wissenschaftliche Heilkunde of Königsberg, April 15, 1889. It is a practical endorsement of the improved method of practising electrolysis recently introduced by the veteran Voltolini of Breslau, with some modifications of apparatus.

The introduction of electrolysis into therapeutics is credited to Mongiardini and Lando; who preceded Crusell, whose publications in 1841 gave the practical impulse to the method. Kafemann employs a battery of thirty-six Gaiffe zinc-carbon elements excited by a solution of zinc chloride.

With von Bruns, Voltolini, and others, Kafemann rejects the galvanometer on the proper grounds that individual sensitiveness to the current varies so as to render the galvanometer useless as a controlling medium. The electrodes are, like Voltolini's, double electrodes with multiple sharp needle-points. The conducting portions are of German silver; the needles are gold. From large experience in the treatment of follicular pharyngitis, lymphoid hypertrophy at the fornix of the pharynx, hypertrophy of the turbinate bodies, and even the condition best known as *ozæna*, Kafemann has found this method curative, and curative much more rapidly than any other. He likewise mentions an instance of cure of pachydermia laryngis, and recommends the method in the infiltrations of tuberculosis of the larynx. J. S. C.

THE TREATMENT OF EPILEPSY. By WILLIAM ALEXANDER, M.D., F.R.C.S., Honorary Surgeon, Royal Southern Hospital, Liverpool, etc. 8vo., pp. viii., 220. Edinburgh and London: Young J. Pentland, 1889.

HAVING organized an institution near Liverpool for the care of epileptics the author publishes his views regarding the treatment of this disease. He begins by admitting the failure of a method which he urged some years ago, namely, the ligation of the vertebral arteries. He then proceeds to advance the claims of another operation—the excision of the superior cervical sympathetic ganglia.

Starting with the assertion that “the sympathetic nerves may have something to do with epilepsy, either as a cause or as a means of cure” (page 15), he cites in its support a number of authors whose writings antedate the present epoch of neurological research, and whose conclusions are without pathological basis. He then goes on to state the theoretical considerations which led him to undertake this operation. “Seeing its extensive connection with the cerebral vascular system, may we not hope by interference with this ganglion to alter the nutrition of the brain and gradually render the equilibrium of the nerve cells more stable?” (page 17). The grounds for this hope remain obscure. For all recent physiological investigations upon the sympathetic system, such as those of Francois Franck and Gaskell, and all its pathology, as so carefully worked out by Möbius, appear to have been entirely overlooked by the author or consciously omitted as likely to destroy his hopes. Having once relieved a patient with *tic convulsif* (whose reflex origin is evident from the existence of painful points, pressure on which arrested the spasm), which is wrongly ascribed to a discharging lesion of the cortex (pages 20–22), by excising the ganglion, Dr. Alexander decided to excise others. He describes the operation carefully, and then gives the records of twenty-four cases of epilepsy in which it was done. A careful perusal of these records fails to substantiate the assertion

made in the summary of results that six were cured and ten improved. In two of the twenty-four cases, neither of them pure epilepsy, both being hysterical young women, the fits ceased or diminished about six months after the operation. In none of the others can an approximate cure be claimed, and one is amazed both at the claim and at the lack of scientific accuracy which ascribes an improvement after a lapse of one or two years to an operation whose immediate effects upon the disease are in no way apparent. In the summary it is stated that five cases remained unimproved; but as a fact in fifteen of the cases the attacks appear to have remained about the same in character and in frequency. Under these circumstances one is at a loss to know why any mention of this unfortunate operation should have been made. For the impartial critic cannot but admit that, like the ligation of the vertebrals, it offers no hope at all.

The physiological effects of the operation are very imperfectly studied; the remarkable assertion being made that "where one ganglion only is removed we have contracted pupil and drooping eyelid; when the opposite side is also operated upon the inequalities disappear, and it is impossible to say that the cases have been operated on at all" (page 112). In the photographs which are supposed to support this assertion it may be noticed that an attempt to conceal the evident double ptosis has been made by having the patient look at a point considerably above the horizontal line while the picture was being taken.

In four of the cases post-mortem records are presented, and it is asserted that there is "an increase of vessels in the pia mater" as an effect of the operation (page 117). In two of the four cases the records fail to support this conclusion, while in one of the others the patient died of broncho-pneumonia, and all the organs were congested, the brain included. The statement that in the remaining case a cerebral abscess was found would lead one to some caution in ascribing any dilatation of the vessels or increase in their number to a cause so doubtful, to say nothing of the impossibility of making any such assertion at a post-mortem table as that the vessels of the pia mater are "increased."

The remainder of the book contains a brief discussion of the usual methods of treating epileptics; although it is evident that a lack of care in the selection and management of cases has led the author to condemn too severely the use of bromides, which in spite of his opposition remains the only reliable means at our disposal. He seems to place some reliance upon percussion of the spine!

The chapter upon the care and education of epileptics is admirable and deserves commendation, as it is a subject too often omitted from therapeutical works. The records of thirty-six post-mortem examinations upon epileptics add nothing to our knowledge of the morbid anatomy of the disease. The work is lacking in that critical insight and in that careful study which characterize Gowers's admirable monograph on epilepsy, and in that definiteness of statement which distinguishes Erlenmeyer's work on the therapeutics of the disease. M. A. S.

LEÇONS DE GYNÉCOLOGIE OPERATOIRE. Par VULLIET, Professeur à la Faculté de Médecine de Genève, etc., et LUTEAUD, Professeur libre de Gynécologie l'École pratique, etc. Pp. 448. Paris: J. B. Baillière et Fils.

LESSONS IN OPERATIVE GYNECOLOGY. By VULLIET AND LUTEAUD.

THE world is under no slight obligations to France for its contributions to gynecological literature. The roll of brilliant names glitters with Récamier, Huguier, Aran, Nonat, Bernutz and Goupil, Courty, Péan, and others. Though these men have given lasting memorials of their efforts and have advanced gynecology as a science, none of them, we believe, has published a distinctively surgical work, and it has been the task of the authors to prepare such a work; one which should be for their French *confrères* what Hegar and Kaltenbach's is for Germans, or Hart and Barbour's for Englishmen, or Emmet's for Americans. At least, we presume that such was their intention from their prefatory remarks. But their work cannot properly be compared with either of these, for it is far less comprehensive in its scope, and leaves a gap still unfilled for a complete treatise on operative gynecology. The treatment of disease of the bladder and urethra is not mentioned aside from the chapter on vesico-vaginal fistula, and, what is more incomprehensible, not a word is said concerning diseases of the ovaries and tubes, and their surgical treatment. The subject of electricity, too, which is at present one of the most important in uterine therapeutics, is barely alluded to, and Apostoli and his remarkable work are not even mentioned. Five chapters, more than one-sixth of the book, are devoted to the subject of sterility, the various methods of artificial impregnation, which have usually been barren as to results, being described minutely.

The book is very loosely bound, and many of the plates, so important a feature in a work of this kind, are very indistinct. We regret exceedingly that we cannot speak in more commendable terms, but, in view of the many excellent works on this subject, we cannot help feeling that more was to have been expected from men of such recognized capability as the authors.

A. F. C.

THE CAUSATION OF DISEASE. AN EXPOSITION OF THE ULTIMATE FACTORS WHICH INDUCE IT. By HARRY CAMPBELL, M.D., B.S. (Lond.), Member of the Royal College of Physicians; Assistant Physician and Pathologist to the Northwest London Hospital. 8vo., pp. x., 368. London: H. K. Lewis, 1889.

So few medical works of a purely philosophic nature have been published of late, that the appearance of one upon so abstract a subject as the ultimate causation of disease cannot but attract attention and perhaps excite a feeling akin to admiration for the courage of its author. He has no new facts to present, no new theory to advance. His aim is to educe from the unformulated facts of etiology generalizations which may be suggestive in further investigations.

Cause is defined as "the sum of those material conditions from which a given effect has necessarily followed." Disease is a vital process; it is an "abnormal mode of life." Life may be defined as "a certain inter-

action of cell and cell-environment." The ultimate cause of life is, then, "the material conditions as constituted by the cell plus all those material conditions of the cell-environment which take part in the vital interaction," and we have only to insert the word "abnormal" before "vital" in this definition to obtain our definition of the cause of disease. From this it appears that all disease must depend upon "(1) peculiarity of cell- or tissue-structure; (2) peculiarity of cell-environment; or, finally, (3) peculiarity of both." Structure and environment are, then, the factors which must be discussed.

Structure is found to depend almost entirely upon heredity, and eighty pages are occupied in the discussion of their relations.

Environment is capable of producing structural change as well as affording abnormal surroundings, and has consequently a twofold causative action in disease. In multicellular organisms it must be remembered that "we have to deal, not only with an external-body-environment, in the shape of food, air, and so forth, but with an internal-cell-environment." So intimate is the interdependence of all parts of the body, that it is difficult to conceive disease in one unassociated with derangement of all, due to disturbance of the "internal-cell-environment."

This is the gist of the argument. The book is an extended attempt at its elucidation. Much space is given to the doctrines of evolution as throwing light upon the action of environment. Throughout the book the influence of the writings of Darwin and Spencer is most apparent. At the end a chapter on the etiology of malignant growths is introduced, in which the theory of the dependence of the disease upon the action of microorganisms is advocated.

We cannot but feel that it is questionable whether there is sufficient practical suggestiveness in the author's generalization to warrant the expenditure of the time necessary for the production of so elaborate a work.

J. S. E.

STUDIES IN CLINICAL MEDICINE. A RECORD OF SOME OF THE MORE INTERESTING CASES OBSERVED AND OF SOME OF THE REMARKS MADE AT THE AUTHOR'S OUT-PATIENT CLINIC IN THE EDINBURGH ROYAL INFIRMARY. By BYROM BRAMWELL, M.D., F.R.C.P. Ed., F.R.S.E., Assistant Physician to the Edinburgh Royal Infirmary; Lecturer on the Principles and Practice of Medicine in the Extra-academical School of Medicine, Edinburgh. Vol. i., Nos. 1-7. 4to., pp. 135. Edinburgh and London: Young J. Pentland. May 3-July 26, 1889.

THIS publication of Dr. Bramwell's promises to be a very valuable series of papers. It differs from those clinical portions of Dr. Richardson's *Asclepiad*, with which one naturally thinks of comparing it, in being less the deliberate statement of the conclusions reached through a rich experience, than the process of upbuilding experience displayed before the reader. The verisimilitude of the form given to the reports of clinics, in which the questions of the examiner, the answers of the patient, and the teacher's comment are given in detail, substantially in the words and order as spoken, will commend itself to advanced stu-

dents, for whom, we may assume the publication is principally intended. The physician of experience, and, *à fortiori*, the clinical teacher, will find this form less fatiguing than might at first be imagined, for it brings the amusing suggestion of his own somewhat exasperating experiences in endeavoring to extract by cross-examination information stupidly or designedly withheld by patients; or to bring some sort of order out of the confused tale of symptoms and medication hurled at him by the chronic dispensary-rounder.

Whether we are to judge from the author's introductory that his methods of examination and illustration are not commonly employed in the Scotch or British schools, we cannot be sure. If we might venture a suggestion to so competent a teacher as Bramwell, we would say that the occasional introduction of a method, constantly used by Da Costa with great success at the Jefferson Medical College, might still further increase the practical value of these admirable clinics and reports. This is, the withholding of extended diagnostic comment until the examination of the patient is completed; then, the main points being succinctly recapitulated, if necessary, by the teacher, the class is called upon for diagnosis. Three or four opinions, which are necessarily representative of those which are most likely to be held in practice, and between which discrimination is needed, are usually ventured; and form the basis of valuable remarks upon the differential diagnosis of the affections in question, and the application of the principles laid down, to the case under consideration.

We have thus far said nothing of the value of Dr. Bramwell's comments upon his cases to students who have long since ceased regular attendance upon lectures, except perhaps in the character of lecturer. This is, in most of the cases, very great. The spontaneous and somewhat colloquial expression, and the exigencies of the occasion, in this manner of teaching, are bound to bring forth the little points of personal observation or preceptorial inheritance, which are either not committed to the serious writing of text-books, or withheld for the further opportunities of study and comparison, which, perhaps, never come. For the same reason that the notes of the lectures of a valued teacher are so much richer in practical instruction, so much more individual and characteristic, than the books of even the same author, these flying comments of Bramwell are likely to become valuable sources of reference; and the author should be encouraged in their publication, which is bi-weekly during the months from October to July inclusive, and the price of the separate numbers is but 6*d.* each. Illustrations, including colored plates, are freely introduced, and the type is clear and readable.

In the numbers before us, among subjects discussed with fulness and authority are "Herpes Zoster," "Exaggerated Epigastric Reflex in Ulcer of the Stomach," "Aneurism of Thoracic Aorta," "Aneurism of Right Common Carotid," "The Histological Changes in Paralyzed Muscles and Nerves," "Phthisis treated by Intra-laryngeal Injections of Menthol and Olive Oil," "Intra-cranial Syphilis," "Mitral Stenosis," "Chlorosis," "Pernicious Anæmia," "Bright's Disease." These titles, selected at random, indicate a wide range of discussion; which is particularly valuable in enforcing the lesson, now so much needed, of the pre-eminent value of catholic reading and experience. The best specialist, except where operative skill or recondite technical knowledge is required, is the accomplished general consultant.

S. S. C.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

COMPARATIVE VALUE OF ANTIPYRIN, ANTIFEBRIN, AND PHENACETIN AS ANTIPYRETICS.

Since the introduction of phenacetin into India, SURGEON-MAJOR A. CROMBIE set himself the task of noting its effects and of comparing them with those of other antipyretics of already established reputation.

The patients were given an antipyretic when the temperature reached 102° . In each instance the following points were noted: The hour at which the drug was given, the axillary temperature at that time, the number of hours that elapsed before the subsequent lowest temperature was reached, the lowest temperature noted after the administration of the drug, the number of hours which elapsed between the time it was given and the time when the temperature was again high, and the number of degrees which the temperature fell.

The antipyretics were used in various diseases accompanied by fever. The first case was one of intermittent fever, where the temperature was reduced by five-grain doses of antifebrin; later in the disease twenty-grain doses of antipyrin were administered, and, later still, four-grain doses of phenacetin. The amount of reduction in degrees and the duration of the reduced temperature were both in favor of phenacetin, but it was given later in the disease than the others.

In another case, one of enteric fever, in a girl, fourteen years old, antifebrin was used in the latter part of the illness. Here there was little to choose between the two drugs, but neither of them compared with plain cold sponging in this case, so far as the permanence of the effect went.

Similar experiments were made with a few other cases, and, although the total number of cases is small, the outcome of the observations will be briefly noted.

As regards efficacy, antipyrin comes first, and there is little to choose between antifebrin and phenacetin, in the doses in which they were given.

So far as safety is concerned, the advantage lies with phenacetin. A sub-normal temperature from phenacetin was not observed; it was, however, seen to follow the use of antifebrin, but there never was collapse, which occurred once after antipyrin. In rapidity of action antipyrin, probably on account of its solubility, comes first, antifebrin second, phenacetin third. The fall after the use of phenacetin is more gradual, and the minimum is not reached for three, four, or five hours after the administration of the drug; the duration of this effect is longest with phenacetin.

As regards certainty of action, they stand in the same order as that of their rapidity—antipyrin, antifebrin, phenacetin. The tabloids of phenacetin were so hard as to be practically insoluble in the stomach, or they dissolved so slowly that a very small quantity of the drug entered and circulated with the blood at one time—not sufficient to affect the temperature. It should be prescribed either in powder or in lozenges which are soft and friable.

In India, phenacetin is followed by just as profuse sweating as either antifebrin or antipyrin. This is a great drawback in the use of antipyretics, patients are obliged to change their clothing once or twice in a night after the use of any of these drugs.

These drugs obviously do not shorten an attack of fever; they have no abortive effect. There are probably a certain number of cases of fever which have been brought to a sudden termination by their use, cases in which there is a sudden attack of high fever after a chill or exposure to the sun, in which a dose of antifebrin or phenacetin is followed by profuse sweating and a cessation of all further febrile symptoms.

In cases of fever where the temperature is very high, Major Crombie believes that it should be reduced at all costs—by the use of cold, if the circumstances of the patient and the prejudices of friends will permit. When we have no choice but to use drugs, antipyrin is the most rapid and certain.

If there is no urgency, the choice would be between antifebrin and phenacetin, sometimes one and sometimes the other will be preferred. If the avoidance of any chance of collapse is desired, phenacetin will probably be the best antipyretic. If, on the other hand, the case requires more prompt interference, antifebrin will be chosen.

Appreciable ill results were not observed; the sweating is certainly unpleasant, but is compensated by the feeling of relief which the fall of temperature brings with it; the patients prefer the drug and the sweating. Phenacetin undoubtedly possesses a soothing and soporific effect, so much so that in cases of slight feverishness, accompanied by insomnia and great restlessness, small doses of three or four grains of phenacetin, not sufficient to produce perceptible diaphoresis, insure a quiet, peaceful, and sleepful night, with no headache in the morning.

In heat apoplexy, sunstroke, and hyperpyrexia generally, antipyrin is indicated; in temperatures of 103° to 105° , antipyrin or phenacetin; in temperatures below 103° , the preference should be given to phenacetin.—*Indian Medical Gazette*, July, 1889.

DANGERS OF ANTITHERMIC AND ANALGESIC ANILIDES.

Among the crowd of modern drugs it is difficult to have a clear conception of their individual action and uses; when it is possible to class them according

to their chemical or other relationships, the group characteristics may be more readily kept in mind as a useful guide to their administration. A group of antipyretics, having aniline as a chemical basis, may be profitably considered from this standpoint. In aniline one may replace an equivalent of hydrogen by formyl or by acetyl, and obtain formanilide or acetanilide; these are the simple anilides. There is further a second equivalent of hydrogen which may be replaced by an alcohol radical, methyl. In this way other compounds, methylformanilide and methylacetanilide, are obtained. It is probable that these substances partake, to some extent, of the poisonous qualities of aniline; and arranged according to their poisonous doses for animals, the methylacetanilide is the most poisonous, then acetanilide and methylformanilide, and, last, formanilide. Their toxic properties increase in proportion to their molecular weights.

By comparing the action of these substances upon animals we may, perhaps, have some hint of the secret of their medicinal virtues and the dangers of their use in practice. They are found to modify the chief systems of the economy, the nervous, the muscular, and the circulatory.

Experiments show that the blood is profoundly altered, arterial blood becomes darker, and, as shown by Henocque, by means of the spectroscope, there is a gradual reduction of the oxyhæmoglobin, and methæmoglobin appears. Analysis of the gases in the blood shows that the oxygen is diminished, and the analyses of Aubert indicate that the amount of fibrin is diminished. Although the number of blood corpuscles is not lessened, there seems to be produced by the members of this group what may be called an asphyxia of the blood corpuscles.

The temperature may be lowered one or two degrees by small doses, four or five degrees by moderate doses in three-quarters of an hour, fatal doses reduce the temperature twelve or fifteen degrees in two or three hours.

Upon the muscular and nervous systems their action is profound; after moderate doses of formanilide there is slowness of movement, a torpid state, and more or less loss of reflex power; after such a dose the power of movement is gradually regained, but a slight ataxia usually remains for some time. Large doses produce complete loss of muscular and nervous power; an animal to which such a dose has been given lies helpless, but still sensible to pain. After still larger doses there occur convulsions, dyspnœa, coma, and death.

The lungs and other organs of an animal dying in this way present the changes typical of asphyxia.

Inhalations of ether stop the convulsions; section of the spinal cord limits the movements to muscles above the point of section.

The action of the other anilides is much the same as that of formanilide. They produce peripheral paralysis and affect the cerebro-spinal centres. The hope that methylformanilide and ethylacetanilide would show less toxic power than the simple anilide is overthrown. Methylacetanilide, under the name of exalgine, calls for as much care in its administration as the other anilides.

It is obvious that extreme prudence should be exercised in the employment of the members of this group.—*Gazette Hebdomadaire*, September 13, 1889.

INTRA-VEINUS INJECTIONS OF SALT SOLUTION.

The indications for increasing the volume of the blood, when it has been suddenly diminished, may be met at any time by every practitioner. It is, therefore, desirable that physicians should be familiar with some of the principles involved in the use of this means of reviving a patient, especially as the operation is a simple one.

DR. WILLIAM HUNTER has drawn attention to this subject, in a recent number of an English journal, which contains a summary of the lectures given by him on transfusion.

It should be borne in mind that transfused blood possesses no nutritive value. Transfusion is, therefore, useless in all forms of "atrophic" anæmia, where the changes in the blood supply simply correspond in degree to the wasting changes occurring in other tissues. The examination of the blood alone enables us to determine whether the anæmia is "atrophic" in its nature or not.

Blood, rather than salt solution, may be needed where the red corpuscles are incapacitated, as in carbonic oxide poisoning, where venesection should always precede the transfusion. Even then the procedure is of doubtful value. There is scarcely a single condition of the blood in which the want of red blood-corpuscles is a source of urgent danger.

After the greatest losses of blood in animals a sufficient number of red corpuscles always remain in the circulation to carry on respiration, provided the circulation is maintained. In man, the loss of blood can never be so great as in animals, as syncope occurs earlier.

Blood is, therefore, not required to carry on respiration after sudden loss of blood in a patient previously healthy. Nor does transfusion of blood, rather than saline solution, seem to be indicated on account of its respiratory value in anæmia.

The immediate source of danger from sudden loss of blood is the fall in the blood-pressure to a point where the circulation cannot be maintained; the indication is, therefore, to raise the pressure within the vessels, for death will ensue unless means be taken to meet the threatened failure of the circulation.

While defibrinated blood may have certain advantages over saline solutions, in restoring the tone of the vasomotor centres, these advantages are more than neutralized by other and still greater disadvantages. For example, it is difficult to obtain blood in sufficient quantity or with sufficient rapidity, as compared with the ease with which a simple saline solution can be prepared. There are dangers attending the transfusion of blood not encountered when saline solutions are used.

For practical purposes all the advantages to be gained by transfusion may be equally well and more readily obtained by injecting a neutral saline, such as a three-quarters per cent. solution of common salt (about one drachm to the pint).

The only pressing indication for transfusion is collapse from sudden and severe loss of blood. With regard to its performance, two points may be noted: to use simple instruments, a glass canula with a piece of India-rubber attached, and a clean syringe, and never allow the temperature of the solution to rise above that of the body.

Hydroxylamine muriate	. . . . .	1 part.
Water	. . . . .	1000 parts.
Chalk	. . . . .	a sufficient quantity to neutralize.
Mix and filter.		

The great advantage which hydroxylamine has over pyrogallie acid, ana-robin, chrysarobin, and other previously used substances is, that while the latter always deeply stain the skin, it is entirely free from color and from dyeing properties.—*Therapeutic Gazette*, September, 1889.

CHLORAMIDE.

Certain of the properties of this new hypnotic should not be overlooked. It is slowly decomposed by carbonates and bicarbonates, and quickly by caustic alkalies; by weak acid solutions it is not easily decomposed. From this it follows that it is best given in slightly acid solutions rather than in alkaline ones. According to von Mering, the dose is 45 grains. After six healthy students had taken doses of from 15 to 60 grains each, they all slept two hours longer than usual, and only two observed any after-effects, and they complained simply of a slight headache.

DRS. HAGEMANN and STRAUSS gave the drug to fifteen patients suffering chiefly from nervous and cardiac diseases, phthisis and anæmia.

No changes were observed in the constituents or the quantity of the urine. The results obtained varied considerably; sometimes a good result follows the use of 15 grains, while in other cases larger doses were useless. In a few cases it did not always succeed, even in large doses, although the insomnia was unaccompanied by pain. In two cases a smaller amount gave sleep and relieved unmistakable pain.

VON MERING reports it as an unsuitable substance to employ to relieve pain. It is not without unpleasant accompaniments; this is illustrated by one case where the patient complained of dizziness during the whole of the following day, though in this patient head symptoms were caused by sul-phonal to even a more marked degree.

Other observers have arrived at much the same result; at present it may be regarded as an uncertain hypnotic, ineffective when there is pain and liable to be followed by undesirable symptoms.—*Berliner klinische Wochenschrift*, No. 33, 1889.

In another number of the same journal DR. ALT, of Halle, after a considerable experience with this new hypnotic, gives it his endorsement. He believes that it is a desirable addition to our resources, especially in the treatment of simple insomnia. It exerts no harmful effects either upon the circulation, respiration, or digestion, and is followed by only slight unpleasant accompaniments.

For insomnia doses of from 30 to 45 grains were administered, which were followed by sleep in from one-half to three-quarters of an hour in most of the cases.—*Ibid.*, September 9, 1889.

SUGAR AS A DIURETIC.

In the last month's report there appeared an account of the use of sugar of milk as a diuretic, especially in cardiac disease.

According to PROF. DUJARDIN-BEAUMETZ, grape-sugar may be employed for the same purpose.—*Berliner klinische Wochenschrift*, No. 33, 1889.

ERGOT IN CHILDBED.

DR. PINZONI, of Bologna, has made some interesting clinical experiments in order to determine, with something like precision, the value of ergot in childbed. He administered ergot systematically to ninety-one lying-in patients, generally in the form of thirty grains of the powder daily. Seventy-nine similar cases were treated without ergot. After comparing the series, he came to the following conclusions: Ergot has little or no influence on the temperature, at the most a slight rise is occasionally observed. It hastens the pulse a little, yet has no marked influence on the physiological slackening of the pulse observed during the first days after delivery. The physiological increase in the secretion of urine during the first days is favored by ergot. The involution of the uterus, according to Dr. Pinzoni's researches, is either totally uninfluenced by ergot, or slightly retarded. The escape of the lochia remains normal when that drug is given; but clots, as universal experience has proved, are more readily expelled. The lochia seldom remains fetid when the ergot is taken. Ergot delays the after-pains in primiparæ, and lessens them when they have already commenced. The secretion of milk is retarded and lessened by ergot, and sometimes completely suppressed. Ergot seems, in the opinion of Dr. Pinzoni, to be a prophylactic against puerperal fever, an indirect antiseptic agent. When infection has already taken place, ergot appears, on the other hand, to hasten the entrance of the virus into the circulation. Dr. Pinzoni's researches appeared in the *Bolletino delle Scienze med. Bologna*, series vi., vol. xx.—*British Medical Journal*, Aug. 10, 1889.

FOR MIGRAINE.

The following powder is recommended by DR. HAMMERSCHLAG:

R.—Caffeinæ citratis	. . . . .	grs. xv.
Phenacetini	. . . . .	grs. xxx.
Sacch. alb.	. . . . .	grs. xv.

Divid. in part aeq. No. x, ad caps. amyl.

Sig.—One capsule every two or three hours.

FOR TOOTHACHE.

The following liquid may be used to moisten a piece of cotton to be inserted into the cavity of a painful tooth to give relief:

R.—Extr. opii	}	. . . . .	āā	grs. viij.
Bals. Peruv.				
Masticis	. . . . .			grs. xv.
Chloroform			ʒijss.

—*Therapeutische Monatshefte*, August, 1889.

MEDICINE.

UNDER THE CHARGE OF

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SOME REMARKS ON TYPHOID FEVER; WITH AN ANALYSIS OF 129 CASES.

F. C. SHATTUCK (*Boston Medical and Surgical Journal*, cxxi. 221, 1889) analyzes the results of his experience with typhoid fever in the Massachusetts General Hospital during the last three years. He excludes all abortive or otherwise doubtful cases, but includes those patients who entered the hospital in a desperate condition and died within a few days. In this connection he remarks on the occurrence of abortive typhoid fever, questioning how anyone of experience can doubt its existence, and quoting from the literature of the subject to show that typhoid fever can certainly be present even without the slightest elevation of temperature. Of the 129 cases, 11 died, a mortality of 8.8 per cent. In none of these was unusually or continuously high temperature a feature. A table is given showing the state of the bowels, the occurrence of epistaxis, and the existence of splenic enlargement. This table shows that in 51 per cent. there was no diarrhoea, and in 36 per cent. the bowels moved only after enemata. In only 25 per cent. was looseness of the bowels really a prominent feature, a smaller percentage than the text-books would usually indicate. Epistaxis was present in 38 per cent. The author is inclined to consider splenic enlargement less common than usually supposed. He gives a table of the frequency and character of the complications and sequelæ, and calls attention to the fact that there was no instance of perforation among his cases.

In discussing relapse, the author follows the English writers in defining it as a renewal of the typhoid process, irrespective of the time of its onset; as opposed to the Germans, who claim that to constitute a relapse there must have been an interval of apyrexia of varying length. 21 (16.28 per cent.) of his cases suffered relapse, but as one of them relapsed twice, there are 22 secondary attacks for study. In 11 of these the relapse was intercurrent, *i. e.*, occurred before complete defervescence, before the first normal evening temperature; and in 11 others it was consecutive, *i. e.*, developing after defervescence. This fact proves, he thinks, that we are powerless to prevent a relapse, and that errors in diet have nothing to do with it. In the great majority of his cases the second attack started without any change in the liquid diet. Various causes may occasion a return or an exacerbation of the fever, but to produce a relapse there must be a re-infection or auto-infection.

In the 11 intercurrent cases the relapse took place in from the third to the fifth week. In the 11 consecutive cases it appeared after an interval of from one to nine days. 21 of the cases recovered, the average duration of the second attack having been nineteen days, but with an individual range of from eleven to twenty-nine days. The author has excluded from this list those which might be classified as instances of aborted relapse, on account of the difficulty in distinguishing between such very short attacks and some obscure complication. His experience does not bear out the German view that intercurrent attacks are more dangerous than consecutive ones.

In 18 of his 22 cases the fever reached its height on the fourth to the sixth day, and more often on the fifth than on any other day. The sudden fall of the temperature on the eighth to the ninth day, mentioned by Irvine as characteristic of relapse in typhoid fever, the author has not been able to corroborate throughout. In only 6 of his cases did this drop occur on either of these days. In some it was noticed on the sixth, in more on the tenth or the eleventh, and in others the fever terminated by an uninterrupted but gradual lysis.

The treatment was essentially expectant. In 29 per cent. no drug of any kind nor any alcoholic stimulant was given at any time. Digitalis and cocaine were the cardiac stimulants employed when such medicines were indicated. The author was especially pleased with the apparently prompt and marked action of the latter in some cases. Calomel and naphthalin were administered in a few cases to see whether intestinal antiseptics could be procured, but the results were not encouraging. The author used the internal antipyretics a good deal in 1886, but very little in the two succeeding years, and only then when the fever itself appeared to interfere with the comfort of the patient. The knowledge which we now possess renders it probable that it is not the high temperature which is the great cause of death in typhoid fever, but the influence on the nervous system of the alkaloidal poisons produced in the living body. The author quotes the experience of several observers in support of this statement. He is being gradually forced to the conclusion that the method of Brand for the treatment of typhoid fever is the best, and that we must come to it in this country. The statistics which Brand gives, and which Shattuck quotes, show how very much less the mortality is in patients treated by this method.

NAPHTHALIN AND TYPHOID FEVER.

E. SEHRWALD (*Berl. klin. Wochenschr.*, 1889, xxvi. No. 22, 492), after a series of bacteriological experiments on the action of naphthalin on the typhoid bacilli occurring in typhoid stools, comes to the following conclusions:

1. Naphthalin in substance, acting at the ordinary temperature of a room on the microorganisms of putrefaction, of feces, and of typhoid fever, hinders their development somewhat, though only slightly.
2. Enlargement of the surface of the naphthalin powder increases correspondingly its disinfecting power. Persistent shaking of the fluid containing naphthalin acts in the same way.
3. On increasing the temperature to that of the human body the action of the naphthalin on all the varieties of bacteria mentioned is decidedly greater;

and it therefore becomes probable that it is in the form of a gas that naphthalin acts injuriously and destructively on the microbes.

4. Naphthalin, as a gaseous disinfectant, must act more energetically on the aërobic varieties in fluids than on the anaërobic forms. So, also, it will affect more completely those which grow on a solid culture medium than those living in a fluid.

5. The conditions for the action of naphthalin are much more favorable in the intestine than in the reagent glass; since not only does the body-heat produce a powerful volatilization of the substance, but through the peristalsis the intestinal contents are constantly kept in motion and new portions of the fluid brought into contact with the naphthalin gas.

6. Naphthalin added to feces outside of the body diminishes the number of microbes contained in them about one-half. When given internally it reduces the number to about one-third to one-fourth of the original. The quantity then increases, however, to nearly the initial amount, owing to the great increase of microbes which are more resistant to the action of the drug.

7. The bacteria of the typhoid stool are acted on very powerfully by naphthalin, and reduced nearly ten times. Also on those still remaining after the administration of calomel naphthalin acts very injuriously.

8. Since typhoid fever is to be regarded as a mixed infection, naphthalin, on account of its action on microbes, should be given from the beginning of the affection. And since its gas, at the temperature of the body, acts with especial power in hindering the growth of the typhoid bacilli, the therapeutic employment of the drug is still further justified in this disease.

9. Since calomel has a disinfectant action on a portion of the fecal bacteria in typhoid fever, but spares other forms which are more subject to the action of naphthalin, the earliest possible combined administration of the two drugs must seem to be the most rational procedure.

10. The naphthalin introduced into the intestine is absorbed in part, and undergoes a change in the body and is excreted in the urine. The decomposition-products from the naphthalin, which are found in the blood and urine, have no restraining power on the growth of the typhoid bacilli.

The author believes that the results of his experiments fully justify us in continuing the administration of naphthalin in typhoid fever, with the hope that we may exert a favorable action on the disease.

EQUINO-TELLURIC ORIGIN OF TETANUS.

VERNEUIL (*Prog. Méd.*, April, 1889; *Manchester Med. Chronicle*, June, 1889) terminated the reading of a memoir on this subject at the Académie de Médecine with the following conclusions: 1. Tetanus is transmissible not only between animals of the same species, or of different species, but also from man to man, from animal to man, and reciprocally. 2. Contagion between a tetanic horse and man may be direct or indirect, mediate or intermediate. 3. The intermediary agents are all those objects which, whatever may be their nature, come into contact with a tetanic horse and receive undestroyed the virulent element; multiplicity of contacts and objects increases, therefore, the circle of infection. 4. Living beings can serve as organs of transmission without their being themselves affected; but they are then under the

menace of tetanus by traumatic auto-inoculation, this being effected as soon as a point of entry is open to the virus. 5. A wounded man can contract tetanus from the greater part of the objects with which his wounds come in contact, but the cases and experimental researches show that the most dangerous is the horse and all articles connected with it, and cultivated earth and some of its products. 6. The earth only possesses a tetanic virulence after contamination with a tetanic horse. 7. Statistics show that the greatest liability attaches to those who are in habitual contact with horses. The topographical distribution of human tetanus is parallel to the equine variety. In our climate the latter, like glanders, is the more frequent. The prophylaxis of human tetanus is, therefore, in the hands of the veterinary surgeon.

ANTIFEBRIN IN EPILEPSY.

TH. DILLER (*Therapeutic Gazette*, June, 1889) reports in detail the results of his employment of antifebrin in nine cases of epilepsy. The drug was administered in doses of four grains three times a day; though in two cases the amount was doubled.

He sums up his experience in the following conclusions:

1. That in all the cases in which the drug was given continuously there was noted a reduction in the number of the fits, ranging from about 25 to 75 per cent. as compared with other months during which patients were on bromide and tonic treatment.

2. The remedy was in all cases well borne, producing no apparent mental or physical depression. This is in marked contrast with the depressant effects noted after a course of bromide treatment.

3. No eruption of the skin was produced.

4. In any case where a great number of fits are occurring, and in which it is desirable to control them as soon as possible, the bromides would be of far more value than antifebrin.

A CASE OF TUMOR OF THE CAUDA EQUINA, ILLUSTRATING CERTAIN POINTS IN SPINAL LOCALIZATION.

THORBURN (*Manchester Medical Chronicle*, June, 1889, 177) reports the following interesting case of tumor of the cauda equina: The patient, a man of thirty-one years of age, had no history of syphilis or alcoholism. Six years previously he had commenced to suffer pain in the lower part of the back, extending thence down the back part of the lower limbs to the heels. Coincidentally with this he experienced difficulty in micturition at times, and obstinate constipation. This condition lasted until eight months before he came under observation, and may be called the first stage of the disease. The pain in the back of the legs was now gradually replaced by numbness, and pain developed in the front of the thighs, from the hips to the knees. At the same time the patient noticed feebleness in the lower limbs, especially on the right side. After this there came loss of the power of coitus, though with occasional erections and nocturnal emissions. This condition of affairs, which lasted until three months before entering into the hospital, the author calls the second stage of the disease.

For the last three months the pain, numbness, and muscular weakness had

grown worse, and he had ceased to have erections. This was the third stage of the affection.

On admission to the hospital, the lower limbs were wasted; there was no paralysis, though all the muscles were weak, and the toes showed a tendency to drop in walking. Muscle sense and the electrical reactions were normal; the bowels obstinately constipated, and the urine absolutely retained. The sensory affections were most interesting. The lower lumbar vertebræ in the middle line were painful on pressure and on movement. There was pain over the front of the thighs, but no exaggeration of sensibility to pain on touch. There was nowhere absolute anæsthesia, but great blunting of sensation in the penis, scrotum (except at the upper part), perineum, gluteal region, and antero-posterior aspects of the upper parts of the thighs. This blunting extended down the centre of the back of the thighs, over the calves (except on the inner side), and to the soles of the feet, where it was again more developed, but spared the inner aspect of the foot, great toe, and half the next toe. Less marked loss of sensation affected the front of the knees, the outer side of the legs, and the outer side of the dorsum of the foot. The sensory deficiency was more marked in the leg and foot of the right side than of the left. Some sensation was retained in the urethra.

The plantar and gluteal reflexes were lost on both sides; the cremasteric reflexes were retained, and the abdominal exaggeration; there was no ankle clonus; knee-jerk was absent on the right side; and, though present on admission, soon disappeared on the left side.

The author thinks there is no doubt that the patient was suffering from pressure on the cauda equina. The progress of events was too slow for us to suppose that a disease of the lumbar cord existed. The duration of the case and the course of the symptoms pointed toward tumor rather than meningitis. The history of the patient contra-indicated tubercle, and the growth was, therefore, probably a connective-tissue tumor.

In pressure lesions of the cauda equina the lower roots almost invariably suffer most. Consequently, there was first in this case paralysis of the fourth sacral root, which supplies the bladder and rectum, together with irritation, causing pain in the sensory branches of the first three sacral roots. In the second stage, coming on eight months after admission, the third sacral root was also paralyzed, with resulting loss of power of coitus; and at the same time anæsthesia developed in the previously painful areas; while the irritation spread to the third and fourth lumbar roots.

In the third stage, coming five months later, pressure on the second sacral root produced paralysis of the *nervi erigentes*. Anæsthesia was now well marked in the cutaneous distribution of all the sacral roots, and was less obvious in that of the fifth lumbar; pain being confined to the distribution of the third (? and fourth) lumbar roots.

Motor weakness affected most of these roots, but was well marked in the second sacral (supplying the extensors of the toes, etc.), and was still greater in the third and fourth sacral. The first two lumbar roots escaped entirely.

The tumor must have been situated below the upper border of the second lumbar vertebra, because the spinal cord terminates here, and it is clear the cord was not involved. As the third lumbar roots were certainly affected,

the growth must have been situated between the upper border of the second and the lower border of the third lumbar vertebræ.

ORIGIN OF THE VESICULAR RESPIRATORY MURMUR.

DEHIO (*Deutsche med. Wochenschr.*, No. 29, 595, 1889) claims that several clinical facts oppose the explanation given by Boas and Penzoldt of the origin of the vesicular respiratory murmur, according to which it is to be considered as a bronchial respiration, a stenosis-sound, produced in the larynx and modified by passing through the pulmonary parenchyma containing air. Among these facts is the diminution of the vesicular murmur in cases of laryngeal stenosis, though there is a very loud sound of stenosis produced in the larynx. The diminution of the murmur in dry pleurisy, owing to the limitation of motion of the affected side as a result of pain, and the harsh puerile breathing of children, though without any increase of bronchial breathing over the larynx and trachea, are both opposed to the theory of Penzoldt. If heavy weights are laid on one side of the thorax of a man in a reclining position, until the respiratory movements are nearly or entirely prevented, the vesicular murmur is made decidedly weaker than on the other side, which could hardly be the case were this simply a transmitted sound. Dehio holds that vesicular respiration is not a sound transmitted from the larynx, but is produced within the lungs, and he believes that the following experiment demonstrates this: A lung, dried by injections of glycerine and consequently elastic, is distended by air blown from bellows through the bronchus; but at the same time a loose plug of cotton placed in the bronchus does away with any bronchial murmur which might otherwise arise. The ear placed over the lung will now hear no bronchial murmur, but a loud and unmistakable vesicular murmur. We must, therefore, return to the former view, that the vesicular sound is produced within the lung.

Regarding the question as to how this is brought about, there are two possibilities: 1. That the sound is due to vibrations of the air passing through the lungs, these vibrations being seated in the finest bronchioles or in the alveoli; since were they produced in the large bronchi, a bronchial murmur would be the result. 2. The view of Gerhardt, that the vesicular sound is the result of the tension on the pulmonary parenchyma, especially of the alveolar septa, occurring at each inspiration. Dehio believes the following experiment proves that Gerhardt's explanation is not correct, and that the theory of the vibrations of the current of air is the one to be adopted. The glycerine-dried lung is moderately distended, the cotton placed in the bronchus, as before, and for the same purpose, and the bronchus then closed entirely air-tight. If now gentle compression be made on any part of the lung and then the pressure be relaxed, a distinct vesicular murmur can be heard on auscultation. This must be due to the motion of the air from one part of the parenchyma to another under the influence of the pressure, and the return of the same to the compressed alveoli after the pressure is removed. With the moderate distention of the lung, there can be no possibility of tension on the parenchyma such as Gerhardt claims. Since we know, now, that sonorous vibrations of air in the bronchial tubes can only be produced where there is a sudden alteration of calibre, the sound must be developed at the point at

which the finest bronchi normally undergo a sudden narrowing—*i. e.*, at their last bifurcation, and at the point of entrance of the bronchi into the infundibula. The combination of these numerous stenosis-murmurs is the origin of that acoustic phenomenon which we designate the vesicular respiratory murmur. In the living person, however, there is a combination of this with the bronchial sound transmitted from the trachea and bronchi, and altered by passing through lung tissue. The vesicular murmur heard on the living chest is, therefore, somewhat modified, and is not always so distinct as that heard over the prepared lung.

TWO CASES OF ANEURISM OF THE ARCH OF THE AORTA PERFORATING INTO THE SUPERIOR VENA CAVA.

W. T. GAIRDNER (*Lancet*, 1889, i. 1233) reports a case of this rare affection. The patient, aged forty-four years, exhibited very marked cyanosis with general anasarca swelling of the upper part of the body, extending secondarily down the back as far as the sacrum, but not at any time affecting the lower extremities. He was under observation in the Glasgow Western Infirmary for a week before death took place. The patient had for some years experienced a slight degree of pulsation in the neighborhood of the right sterno-clavicular articulation, which did not, however, give him any concern. A week before he came to the hospital he had a sensation as if "something had given way" to the left of the cardiac apex. This was accompanied by faintness, but not by pain. Swelling of the face and right arm followed. There was some dilatation of the superficial veins all over the front, especially on the lower sternal region. The veins of the hands were also distended, more markedly on the left side. A loud double murmur, having the distribution of that of double aortic disease, could be heard all over the front of the chest. The pulse at the right wrist was stronger than at the left, and exhibited here the usual characters of the pulse of unfilled arteries. The pupils were equal. There was some displacement of the præcordial dulness downward and to the left, and another area of dulness beneath the manubrium extending both to the right and left. In spite of the cyanosis there was but little cough or dyspnoea, but a faint tracheal quality of the respiratory murmur could be heard at the upper sternum. Stertor developed before death, but was probably largely cerebral.

The autopsy revealed a general dilatation of the transverse portion of the arch, but with two more localized dilatations, one extending to the right, the other to the left. The first of these compressed the *vena cava superior*, and was adherent to it, forming a round bulging into the interior of the vein, corresponding with the middle and upper third of this vessel. On the summit of the bulging there was a rounded aperture of communication a quarter of an inch in diameter, and an inch and three-quarters beneath the origin of the innominate vein.

Another instance of varicose aneurism of the aorta and superior vena cava is reported by R. SISLEY (*Lancet*, 1889, i. 1184). The patient, a man, thirty-five years of age, laborer, had but an indistinct history of syphilis, and was not intemperate. For some months he had had a cough, but did not complain of shortness of breath. His eyelids were puffy and his face somewhat

swollen on returning from work in the evenings. This condition was only seen at night, and had always disappeared by the morning. Upon one occasion he did not feel as well as usual, and stopped at St. George's Hospital for advice; but he did not consider himself seriously ill, and wished to go home. His face and neck were at this time deeply cyanosed, his eyelids puffy, and his ears almost black. His arms were slightly cyanosed, but the other parts of his body were of a natural color. A double murmur was heard over the middle of the sternum. His mental state was clear, but he was drowsy. He complained of no pain and had no paralysis. The cephalic and jugular veins pulsated.

The diagnosis of an aortic aneurism pressing on the superior vena cava was made. The patient was bled to sixteen ounces, but without relief, and there was considerable difficulty experienced in stopping the hemorrhage. His face and arms became gradually more cyanosed, and he became more drowsy, and finally comatose, and died in about two hours after admission to the hospital.

The autopsy revealed a saccular aneurism three-quarters of an inch above the posterior leaflet of the aortic valve. The opening into the aorta was of a rounded form and one and a quarter inches in diameter. Beyond the opening the sac measured about one and a half inches in its transverse diameter, and two inches from above downward. The aneurism extended between the walls of the aorta and the right ventricle as far downward as the interventricular septum, and upward to a point three-quarters of an inch below the opening of the innominate artery. About the centre of the right posterior part of the aneurism there was an opening into the vena cava immediately above the entrance of that vessel into the right auricle. The opening was of an irregular form, while its edges were ragged and thin, and projecting slightly into the vena cava. The sac contained a small, non-laminated clot, not adherent to the walls.

The author believes that the œdema of the face which the patient often had after a hard day's work, was due to the pressure of the aneurism on the superior vena cava. The final catastrophe was caused by the rupture of the aneurism. He makes a very brief allusion to other instances of this form of varicose aneurism. He accounts for its rarity on anatomical grounds, viz., that to produce it, two layers of pericardium have to be broken through, and adhesions must have been previously formed between the layer covering the aorta and that covering the vena cava, else the rupture would be intrapericardial.

A NEW METHOD FOR THE APPROXIMATE QUANTITATIVE ESTIMATION OF ALBUMIN IN THE URINE.

A. CHRISTENSEN (*Centralbl. f. klin. Med.*, No. 30, 523, 1889, from *Virch. Arch.*, cxv. H. 1) recommends the following procedure: The urine containing albumin is precipitated with a dilute solution of tannic acid, and the precipitate thus obtained suspended in a definite quantity of water, by the aid of a small amount of a solution of gum arabic. In this way a quite permanent homogeneous emulsion is produced.

To find the quantity of albumin in the emulsion, we determine the degree

of its opacity. For this purpose there are required (1) a burette, and (2) a cylindrical glass of exactly four centimetres in diameter. This latter is placed over a piece of white paper, on which a series of black lines, each of a definite breadth, have been made at a definite distance from each other. After the emulsion has been diluted to a certain extent it is poured from the burette into the glass until the lines on the paper can no longer be distinguished from each other. The albumin present is calculated from the quantity of fluid which it was necessary to employ. The author has tested this method and finds it quite accurate as well as practical. It has been found, however, that there is a certain amount of error on account of differences in the intensity of the light and in the individual ability of the observers to distinguish the lines.

SAFRANINE—A NEW REAGENT FOR SUGAR.

GRISMER (*Annales de Soc. Méd. Chir. de Liège*, May, 1889, quoted in *Manchester Med. Chronicle*, x. No. 3, 211, 1889) recommends that as a test for sugar 1 c.c. of urine be boiled with 5 c.c. of a solution of safranine (1:1000) and 2 c.c. of a solution of caustic potash. If decolorization be detected, the urine is diabetic; normal urine containing too little sugar to decolorize completely so much of the reagent. On cooling the solution becomes turbid. The author considers this reagent superior to Fehling's solution, because it is not decolorized by uric acid, creatinin, chloral, chloroform, peroxide of hydrogen, or the salts of hydroxylamine, all of which reduce the Fehling's fluid, and thus lead to an error in diagnosis. It is true that chloral and chloroform attenuate the red color of the safranine, but never to a complete decolorization. On the other hand, albumin decolorizes it wholly, but only after some length of time. Occasionally normal urine will also do this, but the author believes that it then contains a little sugar, for on submitting it to the fermentation test such a specimen will show bubbles of carbonic acid gas rising to the surface, no further decolorization being obtainable on adding more of the reagent.

THE DETECTION OF GONOCOCCI.

J. SCHUETZ (*Münch. med. Wochenschr.*, xxxvi. No. 14, 235, 1889) describes the methods hitherto employed for the detection of gonococci in the blenorrhagic secretion, as consisting simply in the action of an aqueous aniline color, and the removal of the excess of the dye with water. Only in the method of Eschbaum is alcohol used for the differentiation, and even here the nuclei and other portions of the cell remain so deeply colored that the discovery of the microbes, when present only in small numbers, is a difficult matter. The attempts to produce an isolated coloring of the gonococci have failed on account of the fact that these cocci, in contradistinction to other varieties, are decolorized by most acids and by the Gram method. As, however, the gonococcus is not affected by acetic acid to so great a degree, the author recommends the following method as simple and effectual:

The carefully prepared cover-glass preparations are placed for from five to ten minutes in a cold, filtered, saturated solution of methylene blue in five per cent. carbolic-acid water. They are then washed in water, and afterward placed for a moment (as long as it takes to count one, two, three, slowly) in a

solution of five drops of acetic acid in twenty cubic centimetres of distilled water, and at once again washed thoroughly in pure water. Everything in the preparation is now decolorized except the gonococci, which remain distinctly blue. It is now well to double-stain the preparation with a very dilute watery solution of safranin. The action of this color must be slight only, and be at once interrupted as soon as the cover-glass, after being washed in water, shows a trace of the safranin color when held over a white surface. Under the microscope the safranin will be distinct enough. These preparations may be permanently mounted in Canada balsam, which has been warmed on the slide without the addition of any solvent. The gonococci will be found deep blue, and the epithelial cells of the same color; while the pus cells and their nuclei are salmon-colored.

SURGERY.

UNDER THE CHARGE OF

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TRANSFUSION.

DR. WILLIAM HUNTER (*The British Medical Journal*, July 27, Aug. 3, and Aug. 10, 1889) publishes an elaborate experimental and critical study of the value of the different forms of transfusion. The paper is by far the most valuable recent contribution to this subject, and well deserves careful study. His main conclusions as to the practice of transfusion, and the reasons therefor, are:

1. Transfused blood possesses no nutritive value. Transfusion of blood is, therefore, useless in all forms of "atrophic" anæmia, by which term, rather than by the unfortunate term "symptomatic," hitherto given, he would distinguish all forms of anæmia in which the changes in the blood simply correspond in degree to the wasting changes occurring in other tissues.

2. If the condition to be met with is a want of red corpuscles, or an incapacity on the part of those already present to carry on their respiratory functions, then transfusion of blood may possibly be of value. The red corpuscles transfused remain for a certain time within the circulation of their host. Transfusion of blood may conceivably be of value in carbonic oxide poisoning, where the red corpuscles are incapacitated for their work by a close union of the gas with the hæmoglobin of the corpuscles.

3. If the condition to be met with is a failure in blood formation, due, perhaps, to the want of iron in the system, transfusion of blood may be of some value, in so far as we in this way supply the organism with iron in the form in which it can most conveniently be stored up in the body. The two

conditions in which this disturbance is most marked are chlorosis and traumatic anæmia resulting from long-continued and repeated hemorrhages. There is no disease in which transfusion of blood corpuscles is theoretically more indicated than in chlorosis. The anæmia of chlorosis we can, however, readily combat without having resort to transfusion.

The question as to the advisability of transfusion in traumatic anæmia is not so easily answered. Our object here is not so much to relieve any passing danger arising from insufficient bulk of fluid, or want of red corpuscles, as to stimulate blood formation. The recovery is effected with greater rapidity when simple saline solution (three per cent. solution of common salt) is injected than when blood is transfused. Dr. Hunter's experiments show that the recovery after transfusion of saline solution is remarkably rapid.

The time required for the return of the red corpuscles to their original number after loss of blood, without subsequent infusion or transfusion, varies from two to three weeks. With subsequent infusion of simple saline solution it is the same; whereas, with subsequent transfusion of blood, complete recovery is delayed a week longer or more. Further, what is perhaps more striking, and certainly is of more importance, is the fact that during the subsequent recovery the animal generally appears to be in better health after infusion of salines than after transfusion of blood.

Even in traumatic anæmia resulting from long-continued losses of blood, transfusion of blood has, in all probability, no value not possessed by simple saline solution. The former may actually retard blood formation; the latter is at least always harmless, and might be beneficial if it were required.

4. Lastly, if the condition to be met in transfusing blood is a threatened failure of circulation as the result of sudden loss of blood, then it is unnecessary to have recourse to blood transfusion, as infusion of any neutral saline meets equally well, if not better, all the indications. The value possessed by transfused blood in such cases is almost solely in virtue of its physical properties. The chief physical property of blood for purposes of transfusion is undoubtedly its volume. The immediate source of danger from sudden loss of blood is the fall in the blood pressure to a point where the circulation is unable to be maintained.

The obvious indication, therefore, is to raise the pressure within the vessels. In health, the blood pressure is dependent mainly upon peripheral resistance. The effect of a loss of blood on the blood pressure is, up to a certain point, completely neutralized by an increase in the peripheral resistance, due to stimulation of the vasomotor centre. It is only after very severe hemorrhage that this relation between the vessels and the amount of fluid they contain, necessary for the carrying on of the circulation is disturbed. The readiest way in which this can be restored is to replace the lost blood with a certain bulk of fluid. To meet the danger thus arising, the quantity of blood is of more importance than its quality.

In an emergency the infusion of ordinary water (Coates) has been followed by results as successful as any ever obtained after transfusion of blood. Bulk for bulk, pure or defibrinated blood, however, must possess certain advantages over neutral saline solutions free from organic constituents. They doubtless possess a certain physiological value as well as a physical value, inasmuch as blood must have a greater and more immediate effect in restoring the tone of

the vasomotor centres than saline solutions. These advantages, however, are more than neutralized by the other and still greater advantages, namely, (1) the difficulty of obtaining blood in sufficient quantity, or with sufficient rapidity, as compared with the ease with which simple saline solutions can be prepared; (2) the dangers attending the transfusion of blood, as compared with the absolute freedom from danger possessed by solution; and (3) the doubtful value of the transfusion, whether hæmogenic or physical, when compared with saline solution.

Transfusion of blood will long continue to be practised, and its action studied, on account of the many interesting problems connected with the physiology and pathology of the blood, on which it is well fitted to throw light. For practical purposes, however, all the advantages to be gained by transfusion may be equally well and more readily obtained by infusion of a neutral saline, such as three to four per cent. solution of common salt (about one drachm to the pint). The only pressing indication for the performance of transfusion is the collapse from sudden and severe loss of blood. With regard to its performance, two points may be noted: (1) That the simpler the instruments used—a simple glass canula, with a piece of India-rubber attached, and a clean syringe—the more easily will this infusion be effected, and the less likelihood will there be of the injection of air—a source of danger to which far too much importance has long been attached, as it is also one which can readily, with a little care, be altogether avoided; (2) that the temperature of the solution should never arise above that of the body. Under no circumstances is transfusion of milk or of other mixtures possessing what are supposed to be nutritive properties, ever indicated. They possess no value not possessed by an equal bulk of saline solution.

THE TREATMENT OF SURGICAL SHOCK.

F. X. DERCUM (*The Medical News*, September 21, 1889) recommends the following methods of treatment in surgical shock, which he believes to be due to a more or less marked general paralysis of the nervous system:

If the surgeon is about to perform a serious operation, say trephining of the spinal canal with possible opening of the dura, a preliminary rest of several days in bed should be prescribed, to diminish general nervousness and irritability; secondly, excessive care should be used in the administration of ether, the very least possible amount being given; thirdly, etherization being complete, one-twentieth to one-tenth of a grain of strychnia should be injected hypodermatically, and repeated if necessary; fourthly, the operation being complete, and the shock established, the patient is to be at once transferred to a previously prepared hot-water bed, the head being maintained a little lower than the body. Shock continuing unabated, digitalis and atropia are next to be used hypodermatically, and at the same time musk may be injected into the bowel in the dose of fifteen to twenty grains, suspended in mucilage. If the latter is not to be obtained, warm, strong, black coffee is to be used in its stead.

The hypodermatic injection of ether he does not believe to possess much utility. If it acts at all, it must be in a reflex way by the local irritation it produces.

THE SURGICAL ASPECT OF TUBERCULOSIS.

MR. HOWARD MARSH'S lectures (*The British Medical Journal*, July 20th and 27th, August 3, 1889) on this subject, before the Royal College of Surgeons, are, as might be expected, valuable contributions to its literature, and, moreover, are marked by the careful clinical observation and sound judgment which just now are so necessary to aid in settling some of the vexed questions as to operative or non-operative treatment of tuberculous joints. In this respect the following remarks of Mr. Marsh have the greatest practical importance:

"Speaking of the general group of tubercular diseases met with in surgery, I believe that when they are detected early, and are adequately treated by prolonged rest, in not more than at the most ten per cent. do they develop to any formidable degree. It is a rule to which I have seen but few exceptions, that when, for example, a knee or an elbow, which is the seat of tubercular disease of less than three months' duration, is enclosed in well-fitted splints, and is kept at rest, the case gives no further real trouble. The symptoms begin at once to subside, and the improvement, though it is slow, goes on without material check until the joint is apparently free from disease; while, after a longer period of rest, complete recovery is secured. I am confident that the period required for treatment in early cases does not, as a rule, exceed twelve or eighteen months. I have met with many instances in which after this time no trace of disease, beyond slight muscular wasting, has remained. In more advanced cases, though the period occupied is longer, the same treatment will lead to good repair.

"The treatment adopted has been that of prolonged rest in the horizontal position, combined with weight-extension of the affected limb. This method, although, of course, it involves some important details, is, in principle, so simple and so well known that it is needless to describe it; but the method of dealing with suppuration claims more particular notice. All abscesses have been opened as soon as detected. An incision from an inch to an inch and a half in length is made, matter is evacuated by gentle pressure, and a small drainage tube, just long enough to enter the cavity, is used for two or three days. The dressing has consisted of carbolic gauze, next the wound, and this has been covered superficially with alembroth wool. The dressing is changed according to the case. In many instances the wound closes in a fortnight or three weeks, sometimes even sooner; in others it becomes a sinus, which discharges for a month or six weeks, and then heals; in others, again, suppuration remains free for several weeks, or even longer, and further openings have to be made; but at length, in a large majority of cases, the wound heals, and no further suppuration, except in a very few instances, takes place.

"I am aware that the question whether abscesses should be opened at once is still under discussion. It is well known that, if left to burst spontaneously, they often do so quietly and without accession of fever or constitutional disturbance; but they have been opened in the cases I am alluding to (1) because, as experience amply shows, if left they frequently steadily enlarge, and lead to wide infection of the surrounding structures, and to the develop-

ment of long devious sinuses, which become themselves lined with tubercular growth, and the seat of long-continued and exhausting suppuration, attended with the maintenance of a high temperature; (2) because, by the method of incision, draining, and careful dressing, these abscesses may be safely evacuated without the occurrence of those septic changes and their results—hectic, high temperature, and wasting, which formerly were so liable to be met with—so that the period and also the dangers of suppuration are very materially curtailed.

“It is true that such abscesses may be absorbed; indeed, their absorption, I believe, is more frequent than some observers might think; but this event is, after all, so rare that it ought not to be allowed to interfere with any general rule of practice.

“I am sure, from considerable experience of both methods, that evacuation by free incision and drainage is much to be preferred to aspiration; for although some abscesses, when once emptied by the aspirator, will never refill, this is not the case with the majority; the majority commonly fill up again every week or every fortnight, and at length have to be incised, while, in not a few, septic changes occur after aspiration, so that this method is certainly not materially, if it is at all, safer than the free incision I have described.”

Mr. Marsh, continuing, reviews the results of excision, mentions the reduction in mortality already effected, and adds:

“I do not doubt that, as operative surgery improves, the immediate results of excision will be greatly superior to those I have referred to. This is foreshadowed by the results reported by Mr. Barker and Mr. Pollard. They will be so good, indeed, especially when the operation is performed early, that unless the results to be obtained without operation are kept well in view, excision will, as I venture to think, be much too commonly performed. It must be remembered that the mere healing of a wound does not show that an operation was the best thing for a patient, or affords any proof that it ought ever to have been undertaken. The main defect of excision will lie in the ultimate result, as regards the usefulness of the limb, when this is compared with a limb in which no operation has been performed, and in which the joint, instead of having been removed, has been restored to that considerable degree of usefulness which can generally be secured by rest. I believe it is now recognized by most surgeons that, although the immediate result of excision of the knee in children may be all that could be desired, the wound often healing by primary union, or at least very quickly, the ultimate result is unsatisfactory. The union between the bones gradually, in many instances, yields; the bones do grow imperfectly, deformity ensues, and the functions of the limb are materially interfered with. It will, I venture to think, be much the same in the case of the hip. The wound may heal by primary union, and the earlier the operation the more probable will this form of union be; but deformity will often ensue, and the limb in many cases will be weak and deficient in usefulness. In short, it will be seen in both cases alike—in the knee and in the hip—that when one of the principal joints of the lower extremity has been removed during childhood, the patient has been seriously crippled.”

SYPHILIS IN OLD AGE.

DR. ALEXANDER RENAULT reviews the subject of senile syphilis in the *Annales de Derm. et de Syph.*, March, April, May, 1889, and calls attention to the differences which characterize this form of the disease. These differences are apparent even in the course and duration of the primary sore. The chancre has at first much the same appearance as that in persons of any age, but it has a remarkable tendency to ulceration. This is a point of some importance, since it is liable to lead to an error in diagnosis, especially if the chancre be extra-genital, for it may in such cases readily be confounded with epithelioma, which is so common in old age. Cicatrization is also slow, many months sometimes elapsing before this process is complete.

Another point worthy of notice is the tardiness in the appearance of adenitis. In the adult this makes its appearance usually within a fortnight, while in the aged its development is often a matter of six or seven weeks. But it is during the secondary period that the peculiarities of senile syphilis are the most striking. The syphilitic fever is apt to be quite marked; indeed, the condition of the patient at this time is sometimes so grave as to give occasion to the diagnosis of typhoid fever, or of profound malarial infection.

The syphilides of the secondary period are distinguished by their tendency to become confluent; by their obstinacy and resistance to ordinary therapeutic measures; by the frequency of relapses, and, finally, by a remarkable proneness to assume the characteristics of tertiary eruptions. Cutaneous gummata are not uncommonly observed at this stage, and in general they appear much earlier in the aged than in adults. On the part of the nervous system the disturbances are often most marked. Disorders of sensation and motion, of the special senses of sight and hearing, and of the mental functions, are commonly met with at this period. And, finally, a profound anæmia and a most pronounced cachexia are often seen, and, indeed, may be regarded as characteristic of the secondary stage of senile syphilis.—*The Medical Record*, September 28, 1889.

LUMBAR HERNIA.

MR. JONATHAN HUTCHINSON, JR. (*The British Medical Journal*, July 13, 1889) exhibited at the Pathological Society the only specimen of lumbar hernia in existence in London. It was obtained from an elderly and rather emaciated man, who died (from other causes) in the London Hospital. The hernia was about the size of one's fist, was situated in the left lumbar region, lying over Petit's triangle, and extending nearly from the last rib to the iliac crest, and it had existed for some years. It could be made to diminish markedly on pressure, was resonant to percussion, and had an impulse when the patient coughed. Gurgling could be detected when reduction was made, returning when the pressure was taken off. It caused the patient no pain, and hardly any inconvenience. It was naturally thought that the hernia protruded through the orthodox triangle, but it was found, on dissection, that this was not the case, as the aperture, which would admit two fingers and was circular in shape, was really situated above and to the inner side of the triangle. The protrusion was, in fact, just outside the quadratus lumborum, through the transversalis aponeurosis and the latissimus dorsi, where the

latter arises from the strong fascia covering the erector spinæ. Another interesting feature at the post-mortem examination was the absence of any peritoneal sac. The looseness of the attachments of the peritoneum in this region is well known, and is taken advantage of in certain operations, such as removing the kidney through a lateral incision. It was quite easy to make the peritoneum, by gentle pressure, protrude into the centre of the hernial tumor, and, as it was certain that it had habitually during life contained intestine, it is obvious that every time the latter was reduced the peritoneal sac must have returned with it into the abdominal cavity. Whether this feature has been present in other cases of lumbar hernia it is impossible to decide, but it is one rarely met with in connection with the more common varieties of rupture.

ETHER IRRIGATIONS IN STRANGULATED HERNIA.

DR. IVAN N. DRAKIN (*The Annals of Surgery*, August, 1889) eulogizes ether irrigations as an excellent means for reduction of strangulated hernia. He simply pours a teaspoonful of ether over the hernial tumor every quarter or half hour, keeping it covered with compresses during the intervals. As a rule, after three or four tablespoonfuls, the intestinal loop slips down into the abdominal cavity by itself; in some cases, however, slight pressure should be applied. In the case of incarcerated scrotal hernia, it is advisable to irrigate with a mixture of ether (twenty parts) and hyoscyamus oil (four parts). When applied sufficiently early, the method is said to give most brilliant results.

DR. A. J. BRUSTEIN (*Ibid.*) describes the case of a woman with an incarcerated umbilical hernia of the size of a man's fist, in whom, after all ordinary procedures for reduction had failed, irrigation with a small jet of ether was resorted to, taxis being continued at the same time. In three or four minutes the reduction was effected with striking ease. The action of local etherization was attributed to a rapid contraction of the intestinal wall, and to the diminution in volume of the hernial gaseous contents caused by the sudden lowering of temperature.

THE EXTIRPATION OF VARICES OF THE LOWER EXTREMITY.

DR. BËNNICKEN reports (*Berliner klinische Wochenschrift*, September 23, 1889) the latest details and results of the method of total excision of varicose veins originally proposed by Madelung, in 1884, at the Congress of German Surgeons. On that occasion both Langenbeck and Schede took part in the discussion, the former opposing, the latter upholding the procedure. Since then but little attention has been paid it by English and French surgeons. König says (1886) that he has given up the ligation and limited excision of the veins, as the best results are obtained from much more extensive operations. Riedel (1885), while deploring the tediousness of the operation, expresses the same opinion. Holtz and Schmid-Stettin (1887) recommend it, while Tillmans, Fischer, and Landerer (1888-89) speak of the certainty of return.

Bënnicken has operated on thirty-two cases, fourteen of which he now reports as remaining cured two years afterward; the others are more recent, and are not included in his statistics. In none of these was there any serious

illness or even inconvenience after the operation. The presence of ulceration was not regarded as a contraindication.

The steps of the operation are briefly: cleansing of the skin; curetting and disinfecting of the ulcer, if there be one; occasionally the latter is surrounded and isolated by an incision, and this is especially necessary if the peripheral portion of the enlarged veins runs across or into the region of ulceration. The wound then makes them easily recognizable. The limb is then allowed to hang over the edge of the table until all the subcutaneous veins stand out; an Esmarch tube is applied loosely at the upper third of the thigh, so as not to interfere with the arterial supply; the skin is again cleansed; an incision in the long axis of the extremity, and following the course of the enlarged vein (generally the long saphena), is then made. This must usually be from one and a half to two feet in length. The skin is then turned back for a hand's breadth on either side. The main trunk is seized above and below with hæmostatic forceps; the intermediate portion with the branches is rapidly isolated by blunt dissection; the veins must sometimes be followed below the fascia and into the muscle. The main trunk is ligated above and below; the venous plexus removed; a few ligatures (two to four) applied; the corners or pockets of the wound drained with small rubber tubes; the skin closed by a continuous suture; an antiseptic dressing and firm bandage applied, and the limb kept in vertical suspension for twenty-four hours. Union generally occurs by first intention. The symptoms of the varicose condition, the feeling of fatigue, the pain, the muscular cramps, etc., as well as the eczema and ulceration, are usually entirely cured.

THE SURGERY OF THE SPINE.

DR. J. WILLIAM WHITE (*The Annals of Surgery*, July, 1889) reviews the history of spinal surgery from early times to the present day, discusses the arguments for and against operation in the three great classes of spinal disease, in which operative interference may be thought of—viz., traumatisms, caries, and neoplasms—and comes to the following conclusions:

1st. The objections urged against operative interference in spinal traumatisms were partly theoretical—hemorrhage, frequency of absolute destruction of the cord, pressure from inaccessible fragments of bone, etc., and have been shown to be unsupported by clinical facts; and were largely due to a well-grounded dread of, (a) the shock, in those cases operated on in pre-anæsthetic times; and, (b) consecutive inflammation, suppuration, and pyæmia in pre-antiseptic periods. The later results, which now constitute our only safe basis for generalization, are distinctly encouraging, and resections of portions of the vertebræ, in fractures, possibly even in dislocations, should be recognized as an eminently proper operation, and in suitable cases altogether warranted by the facts in our possession; and, further, such cases are by no means rare or exceptional.

2d. There can be still less doubt that the testimony of both pathologists and practical surgeons indicates that the causes of the paralysis of Pott's disease is in many instances an extra-medullary proliferation of connective tissue, assuming the density and proportions of a neoplasm, occupying the space between the dura and the anterior surface of the laminae, not apt to be

associated with intra-medullary changes or with destructive degeneration of the cord, and very frequently removable by operation.

3d. Every case of focal lesion thought to depend on a tumor and not distinctly a malignant and generalized disease, should be regarded as amenable to operative interference, no matter how marked the symptoms of pressure may be, nor how long continued.

4th. The method of extension as recently revived is well worthy of preliminary trial in the first two classes, and in obscure cases thought to belong to the third class. It has not yet been tried in a sufficiently large number of cases to establish its exact limitations, but it is unquestionably a therapeutic measure of vast importance in spinal injury and disease.

5th. It is customary and proper in deciding upon any serious surgical procedure, involving risk to life, to consider well the prospects of the patient in the event of non-interference, and to be largely influenced by them. Looked at in this light, the surgery of the spine, as regards traumatism, caries, and neoplasms, may fairly be said to have a rapidly widening field, and to deserve more serious and careful consideration by practical surgeons than it has received for many years.

DRS. F. X. DERCUM and J. WILLIAM WHITE (*Ibid.*, June, 1889) reported two cases of resection of the spine. One died soon after, but the other, who had been for many months a hopeless paralytic, and who was rapidly failing in general health before the operation, is now (October 6, 1889) walking about the ward unassisted and in excellent general condition.

OBLIQUE OSTEOTOMY FOR ANTERIOR CURVATURE OF THE TIBIA.

DR. JOSEPH COLLIER describes as follows (*The Medical Chronicle*, August, 1889) the operation which he prefers in exaggerated cases of tibial curve. It was originally proposed by Mr. Gowan. Neither Esmarch nor tourniquet is required, as the bleeding is only slight, and what little does occur is useful in keeping, by its flow, the wound clean during the operation. The position of the centre of the osteotomy should be at the middle of the convexity of the bone. A tenotomy knife is entered at the anterior border of the tibia and passed under the skin across the subcutaneous surface of the bone and then withdrawn. An Adams's saw is introduced through the puncture and made to follow the track of the knife. The tibia is then sawn through obliquely in a direction from above and within downward and outward. The skin is tolerably movable on the front of the shin, so by pulling it up on entering the saw and gradually dragging it down as we get lower with the oblique division of the bone, it is possible to do the operation through merely a skin puncture. The amount of obliquity must depend on the amount of curve and flattening. If these be at all great—as, for instance, if in a child of from seven to nine years the point of greatest convexity be over two inches in front of the normal—then the obliquity required will be in a line forming an angle of about 60 degrees with the horizontal. In most cases it is good to divide the fibula as well, and this may be done with the saw either through a separate puncture or through the puncture used for division of the tibia by first reëntering the tenotomy knife and passing it through the soft parts to the external surface of the fibula. Lastly, the tendo-Achillis is to be subcu-

taneously divided; it is in every case well to do this, as it enables the deformity to be more easily removed; it relieves tension and pain after the operation, and lessens the tendency to displacement during repair. The tibia should be sawn through, or almost through, for if much bone is left to be fractured, it may break irregularly and projections may interlock and prevent good positioning.

Such an oblique osteotomy as the above, by allowing the lower fragment of the tibia to slide up, as so often happens in oblique accidental fracture of that bone, and especially by allowing an antero-posterior movement of the fragments upon one another in a transverse horizontal axis, will be found to permit a ready and complete reduction of the deformity. The wound having been dressed, the limb should be put up in a back and side splint. It should be taken down at the end of from a week to ten days, when the wound will be found healed; under an anæsthetic the limb may then be moulded into accurate position and fixed in plaster-of-Paris. Any little projection from the sliding up of the lower fragment will soon be absorbed and disappear. If the curve has been excessive, the removing of the deformity in this special manner will of necessity leave the limb with a little possible hyper-extension.

THE EFFECT OF THE ENTRANCE OF AIR INTO THE CIRCULATION.

DR. H. A. HARE (*The Therapeutic Gazette*, September 16, 1889) has made a series of experiments which, he claims, show that the admission of air to the jugular vein is not dangerous unless it is in enormous quantities, while, on the contrary, a much less amount injected into the carotid artery causes death. His theory as to why air injected into the jugular vein is not followed, unless in excess, by bad symptoms, while the same doses kill when sent into the carotid artery, is, that the air in small amount on entering the right side of the heart is, when sent through the pulmonary bloodvessels, expired with the rest of the gases therein contained; and it is only when so large an amount is injected that some of it reaches the left side of the heart that death ensues, owing to the formation of minute clots which act as emboli. That such clots are not formed in the jugular vein he thinks probable from the results reached and from the fact that venous blood coagulates more slowly than arterial blood. The injection of large amounts of air into the carotid where arterial blood is present may cause clots and resulting emboli—a theory, he thinks, still further supported by the symptoms of paralysis or spasm shown by the animals used. It can hardly be supposed that air is a poison in itself to the brain and its centres, particularly the respiratory centre. His conclusions are that—

1. Death never occurs from the entrance of air into the ordinary veins of the body, unless the quantity be enormous—from one to several pints—a quantity which cannot enter unless deliberately sent in by the surgeon.

2. The cases on record have been due to other causes than air, and have not been proved.

3. The tendency of the vessel to collapse and the leakage of blood prevent entrance of air, and it would seem probable that a clot has generally caused death, not the air itself.

[These results are contradictory to those reached by SENN in an elaborate experimental and clinical study of this subject (*Trans. of the Amer. Surg. Association*, vol. iii., 1885), and are directly opposed to hitherto published clinical cases. Among the conclusions reached by Senn were the following: Clinical experience and experimental research teach us that when a certain amount of air enters the right side of the heart, death invariably takes place in a very short time. Insufflation of a fatal quantity of air into a vein produces death by—*a*, mechanical over-distention of the right ventricle of the heart and paralysis in the diastole; *b*, asphyxia from obstruction to the pulmonary circulation, consequent upon air-embolism of the pulmonary artery. Insufflation of the same quantity of air into arteries is *less* dangerous than when introduced into veins.—ED.]

OPHTHALMOLOGY.

UNDER THE CHARGE OF

GEORGE A. BERRY, M.B., F.R.C.S. EDIN.

OPHTHALMIA PHOTO-ELECTRICA.

The last number (May-June) of the Russian *Vestnik Ophthalmologii* contains an interesting treatise by DR. LYUBINSKY on the little-known affection of the eyes which is produced by incautious exposure to a strong electric light. Until the electric light came into use strong sources of illumination did not constitute any factor of etiological importance in the production of eye diseases; hence the subject is one which has only comparatively recently received attention. Those suffering from the effects of exposure to the strong light are almost exclusively professionally connected with electric lighting.

Dr. Lyoubinsky, practising as he does at Cronstadt, has had unusual opportunities of seeing what he has been in the habit for many years of calling ophthalmia photo-electrica. He has met with this affection thirty times, most frequently amongst officers connected with the naval school at that port. The light which has proved most particularly hurtful is the so-called "fighting light" of 14,000 candles power, the strength of which can be appreciated by the fact that it is almost impossible to look at it from Oranienbaum, a distance of seven versets (about $4\frac{1}{2}$ miles). Dr. Lyoubinsky was consulted ten years ago as to the best means of protecting the eyes against those strong lights, and then recommended the use of dark-red spectacles which excluded the blue and violet rays. But as many men complained of discomfort from heat on wearing these spectacles, he began a series of experiments which led him eventually to advise either dark blue or dark gray glasses for those who disliked the dark red ones. The practical drill in connection with the electric light takes place during the day and lasts for an hour and a half. Those who suffer have incautiously looked at the glowing carbon for a minute or so

without any protection. Recurrences are not infrequent, and it appears that when the eyes have been once affected the susceptibility is greater.

The following are the symptoms of the affection: For some time after the eyes have been exposed to the light the patient complains of seeing white objects yellow, or he may merely experience some discomfort or pain in the eyes. These sensations pass off, and for the rest of the day the eyes remain quiet. Great pain, however, comes on again at night, with a feeling of sand in the eyes, and excessive heaviness of the lids. At the same time there is profuse lachrymation, and the photophobia is so great that the patient cannot even bear any light with the eyes closed. The objective examination during this stage is extremely difficult, often practically impossible; the lids are greatly swollen, and the conjunctiva hyperæmic. This state of matters lasts for one and a half to three hours, when the patients are able to sleep, and awake in the morning perfectly well, only experiencing, as a rule, some slight discomfort in the eyes, from which, however, if the conjunctivæ have been previously healthy, there is neither excessive tear-flow nor any abnormal discharge. In some cases there is a recurrence of the same symptoms during one or two nights.

The ophthalmoscopic examination on the day after an attack usually reveals nothing more than some degree of hyperæmia of the disks; the cornea and other parts of the eye are normal. In one severe case, after four attacks, Dr. Lyoubinsky found a number of small, mostly circular, yellow spots in the neighborhood of the macula, which did not appear to give rise to any appreciable scotoma. He believes that, notwithstanding the absence of visible changes in the retina, such changes do play an important part in the peculiar ophthalmia described. But, as the retina is practically insensitive, pain is experienced from the other parts of the eye affected at the same time.

The author refers to the great similarity between the symptoms of electric-light ophthalmia and snow-blindness, the main difference being the comparatively short duration of the former.

CORNEAL ASTIGMATISM AFTER CATARACT EXTRACTION.

At the last meeting of the Italian Ophthalmological Society, which was held at Naples, SCIMEMI gave the result of his investigations into the cause of the astigmatism which may be produced after the extraction of cataract. His paper is published in the *Annali di Ottalmologia*, xviii., 2, from which this abstract is taken.

One hundred and forty-six eyes were examined, some several times at different intervals by means of Javal and Schiötz's ophthalmometer. As is well known, the astigmatism when produced is due almost always to a flattening in the meridian of the cornea perpendicular to the line of section made for the extraction of the cataract. According to Weiss, this flattening is caused by a faulty apposition of the lips of the wound, which, instead of uniting in their entire thickness, do so only in part and in such a manner that the anterior edge lies in front of the other. Becker has shown, by anatomical examination of eyes on which extraction had been performed, that healing does occur in this manner, and he has found that the difference may be as much as 0.20 m.m. Weiss has further calculated that a difference

of 0.12 m.m. would give rise to a flattening which would cause an astigmatism of 2.0 dioptrics; one of 0.30 m.m. a flattening corresponding to 5.5 dioptrics of astigmatism. The point in which Scimemi's observations differ from those of Weiss and a few others who have investigated this matter, is in the demonstration of an alteration of curvature of the meridian parallel to the corneal section. In this direction he has found that the curvature is frequently increased and, indeed, that in many cases such increase of curvature is often a much more important element in the causation of the astigmatism than the diminution in the direction at right angles. Further, he has found that this increased curvature exists in cases when no appreciable difference in level exists in the edges of the wound of the cornea.

Scimemi gives the following explanation of the changes which give rise to the astigmatism. These three changes, viz.: The shortening of the diameter of the cornea parallel to the section, the elongation of that perpendicular to the section, and the displacement of the lips of the wound are, he believes, all due to the action of the recti muscles on the eye. In the normal state of matters, owing to the incompressibility of the fluid in the anterior chamber, the contraction of these muscles exerts little or no influence in altering the shape of the cornea; but it is, he thinks, otherwise when a large wound has been made in the cornea. The lateral recti under these circumstances compress the cornea in the meridian of their action, while the action of the vertical muscles may be supposed to flatten the vertical meridian and displace the lips of the wound. Perhaps the most practical point to be gathered from these investigations of Scimemi, should they be confirmed, is, that the position of the section is not likely, as many have supposed it has, to have any influence on the degree of the resulting astigmatism.

A NEW TREATMENT FOR PANOPHTHALMITIS.

The treatment adopted in cases of panophthalmitis differs in the hands of different ophthalmic surgeons. Some perform enucleation; others, considering that the slight risk which this entails is not justified, eviscerate or incise, or leave the eye more or less to take its own course. DR. CHIBRET, of Clermont-Ferrand, has recently published in the *Revue Générale d'Ophthalmologie* viii. p. 5, a method of treatment based on the principle of removing only the suppurating tissues, and retaining those which have not been involved in the purulent inflammation.

Having made a large opening in the lower portion of the cornea, and with the point of the knife fully detached the iris and exudations lying in the pupil, he injects a solution of oxycyanide of mercury 1 to 1000 into the eye. The injection is made with an Anel's syringe, considerable force being employed, and is continued until the liquid, after dislodging all the suppurating elements of the eye, returns perfectly clear. A short description of five cases in which this treatment was adopted is given. The fever and pain were at once checked in all, and the patient could be discharged on the fourth or fifth day. The indications for preserving all those parts of the eye which have not been destroyed seem to be thoroughly and easily complied with, and the remaining stump is so free from any kind of irritation that Chibret considers that the danger of sympathetic inflammation probably does not exist—a point

in connection with which, however, sufficient experience has not yet been obtained. The proceeding is also recommended by Dr. Meyer, of Paris.

A CASE OF PERMANENT CONJUGATE DEVIATION OF THE EYES AND HEAD,
THE RESULT OF A LESION LIMITED TO THE SIXTH NUCLEUS; WITH
REMARKS ON ASSOCIATED LATERAL MOVEMENTS OF THE EYEBALLS,
AND ROTATION OF THE HEAD AND NECK.

This case, which is recorded in the July number of *Brain*, by Drs. Hughes Bennet and T. Saville, is one of those rare cases in which a brain lesion is so definitely circumscribed that important, all but conclusive, evidence is afforded of the function of that portion which it has involved.

The case is, shortly, as follows: Woman, aged sixty-seven, sudden complete paralysis of left arm on awaking one morning; two months afterward, and without any improvement having occurred in this condition, she found again on awaking in the morning that her eyes and head were forcibly rotated to the right. The result of an examination, made three days later, was: "Both eyeballs were firmly and permanently fixed toward the right side, and the strongest efforts of the will could barely bring them toward the middle line, and in this the left eye was specially deficient. When each eye was tested separately the right could be moved to, and even a little beyond, the middle line, but the left did not reach that point. Both eyeballs converged when an object was brought close to them. The pupil was equal and normal. The head was firmly and permanently rotated toward the right, and could not voluntarily be brought into a straight position. The chin was tilted forward and upward, due to contraction of the left sterno-mastoid muscle." There was no hemianopsia, nor were there any ophthalmoscopic changes. The symptoms persisted until the patient's death, a month later.

Post-mortem. Besides an area of softening occupying the right ascending frontal, "on removing the pons and medulla, and making a transverse section exactly at their junction, a small flat circular patch of softening about one-tenth of an inch in diameter was seen occupying the position of the left sixth nucleus, and limited to it without apparently involving the neighboring structures, such as the facial fibres. Otherwise to the naked eye the appearances of the pons and medulla were normal." Slight traces of degeneration were found, too, in the left adducens.

There was, therefore, in this case complete destruction of the left sixth nucleus, and to this the authors are no doubt justified in ascribing, as they do, all the symptoms with the exception of the paralysis of the arm accounted for by the condition of the cortex, and the permanent rotation of the head to the right. The explanation given for this is that it was probably "due to direct irritation by the lesion in the sixth nucleus upon the neighboring eleventh nucleus, thus causing contraction of the muscle on the same side through the spinal accessory nerve. Hence, the head was tilted over the right shoulder. The sterno-mastoid remained permanently and rigidly contracted." The main function of the sixth nucleus is, therefore, apparently to regulate the associated lateral movements to the same side, and while its destruction leads to a loss of such associated movement it only produces complete paralysis of one muscle, the external rectus.

OTOLOGY.

 UNDER THE CHARGE OF

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 NEW ANTISEPTIC ARTIFICIAL TYMPANIC MEMBRANE.

A new artificial membrana tympani, devised by DR. JOHN WARD COUSINS, of London, is thus described in the *Lancet*, September 14, 1889:

"In shape it is exactly like a hat with a very high and tapering crown and a broad and flat brim, having a short ribbon attached to the edge. It is just firm enough in substance to retain its shape in the ear, and yet the material is so soft and flexible that it causes no sensation by its presence. It is stained a delicate flesh color, and is made in several sizes. When in position the crown rests near the tympanic membrane, the brim upon the wall of the meatus, and the little ribbon or handle behind the tragus. The material of which it is made is composed of compressed cotton fibre, swollen by prolonged immersion, and saturated in an antiseptic oil and ether. The soft material is then firmly compressed in a little machine designed for the purpose, and afterward dried by artificial heat. The instrument is very light, ranging from one-sixth to one-quarter of a grain in weight. It is inserted by means of a special probe, and is extracted by traction on the above-named ribbon or handle." This artificial membrane is also considered by its inventor as a protector and local antiseptic remedy. We are not given any facts as to whether or not this instrument improves the hearing.

 OTOLOGY DURING THE PAST YEAR (1888).

This is the title of a long bibliographical article by SIGISMUND SZENES, of Budapest, which is published in the *Deutsche medicinische Wochenschrift*, September 12th of this year.

The most important articles mentioned by him have been noticed in this journal as they have appeared. Nearly all are from German sources; the few from English and American sources would seem to indicate great ignorance of what has been done in otology in these two countries within the last year. We would note what is said of an article by Gruber, of Vienna, in the *Monatsschrift f. Ohrenheilkunde*, No. 9, 1888, on foreign bodies in the ear. He reports two cases—one of a ball of cotton, and the other of a piece of garlic which had been placed in the ear—which had been improperly treated. In the first case, the physician who was first called on for treatment endeavored to remove the foreign substance with instruments, and was so rough in his manipulations as to set up an otorrhœa which lasted two months. In the second case, a permanent inflammation was excited in the auditory canal and in the drum-cavity, and finally symptoms of periostitis in the mastoid

process. Such cases are coming constantly under the aurist's notice, simply because the general practitioner forgets that he should syringe foreign bodies from the ear, and not grapple after them with instruments he cannot manage in a territory he is unacquainted with. Furthermore, it is not absolutely necessary that foreign bodies in the ear should be removed if they excite no unpleasant symptoms.

Among other diseases of the external ear may be named *othæmatoma*. Arndt (*Internat. klin. Rundschau*, No. 44, 1888) maintains that *othæmatoma* occurs when the reticular cartilage of the auricle is changed into hyaline cartilage, which can ensue locally or come about from some general systemic disease. As *othæmatoma* rarely heals without deformity (shrivelling) Arndt advises that it be treated by a protective dressing or bandage, so that the auricle is irritated as little as possible. After absorption of the extravasation of blood has occurred, the ear will maintain a good form. If the *othæmatoma* spontaneously bursts or is emptied by an incision, shrinking and puckering of the auricle will occur, and even true bone may form in the connective tissue.

THE TAMPON AS A DRESSING IN SUPPURATIVE DISEASES OF THE MIDDLE EAR.

DR. M. D. JONES, of St. Louis, Mo., has recently contributed an article on this subject in the *St. Louis Polyclinic*, August, 1889. The writer first considers the plan of antiseptic tamponading the ear as devised by Læwe, of Berlin: "First syringe the ear carefully with a solution of creolin, carbolic or boric acid, then by means of cotton and inflation free the tympanum as far as possible from all moisture, and finally use the packing." Dr. Jones uses the packing not altogether for its aseptic properties, but largely for its drainage qualities as "the surgeon uses the drainage tube, since, when properly inserted, a tampon of absorbent cotton, by its capillary action, keeps the tympanum free from matter." Furthermore, compression is known to be a valuable aid in treating inflammation, and here the tampon acts well. The tampon as applied by Jones "is made by using small bits of cotton, and with the aid of the mirror, speculum, and probe, these are gently pressed into position, and a compact mass is formed, which supports uniformly the whole of the membrana tympani and walls of the meatus." This must be kept dry, should be removed daily, the ear cleansed, inflated, and a fresh plug inserted. Then inflation is advised again in order to bring the membrana evenly against the tampon to assist drainage. The tampon must not be too tight as it becomes painful; if too loose, it does not act as a drainer, but keeps the pus pent up and renders no support to the inflamed parts.

THE ETIOLOGY AND TREATMENT OF CHRONIC SUPPURATIVE CATARRH OF THE EAR.

This is the title of a very valuable and interesting paper by DR. H. MACNAUGHTON JONES, in the *Lancet* for July 27 and August 3, 1889. The chief aim of the article is to call attention to the prevention of those frequent evidences of either ignorance or neglect in ear diseases rather than "to the hopeless endeavors to redeem lost time in restoring a shattered sense or res-

cuing a life that is doomed." The writer then reviews "the present position of otology both as regards ear-ferments and bacteria," and he then draws attention to the suitability of the ear-passages and cavities for the origin and completion of fermentative processes. There are found in the sinuosities of the various portions of the ear many of the conditions favorable to "life without air," as Pasteur defines fermentation.

A table is given of the causes of chronic suppurative discharges from the external and middle ear. From these tables "we perceive that, with few exceptions, we are confronted with conditions or diseased states that either owe their existence to, or are associated with, special microbes." Gout, indirectly by its tendency to produce a dermal swelling and a pasty secretion in the auditory canal, and eczema very rarely induce suppurative catarrh of the ear. "Sea-bathing is an undoubted source of chronic suppurative catarrh, a result, however, rather more frequently found in those who are fond of diving."

The practitioner must guard against accidental or "deliberate" introduction of the germs into the auditory bloodvessels or lymph-channels, by avoiding the use of oily substances in the external canal, or the introduction of dirty specula, undisinfected Eustachian catheters, bougies, etc. We must also avoid the use of cotton plugs in the ear, as they are heat-producing and moisture-absorbing, and act as "incubating pellets for broods of embryonic germs."

From the etiology of this affection, the prophylaxis should consist in preventing, if possible, the entrance into the blood of the aural structures, of the *materies morbi* of tubercle, syphilis, fevers, diphtheria, and erysipelas. This can be accomplished by therapeutic measures to control the action of the morbid elements in the blood and lymph.

In the second class, the local, we have to control locally the extension of the pathological processes, and the entrance of pathogenic germs into the middle ear, taking measures to destroy them and prevent their invading the underlying tissues. The writer most justly maintains that aural complications can be largely prevented in scarlet fever and diphtheria and other infectious throat diseases, by "early antiseptic treatment of the nasal passages and the nasopharyngeal region, not to speak of direct measures, such as paracentesis of the membrana tympani, when indicated." The treatment of adenoid growths in the nasopharynx, and local remedies for the ear, new growths in suppurations of the ear, and the so-called dry treatment by boric acid, are duly considered. The author avoids all drops in the ears in his practice, relying upon the dry form of treatment.

OBSTETRICS.

UNDER THE CHARGE OF

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THE USE AND ABUSE OF ANTISEPTIC INJECTIONS IN OBSTETRICAL PRACTICE.

GARRIGUES (*Transactions of the American Gynecological Society*, September 17, 18, 19, 1889) believes in the value of prophylactic douches before labor, and repeatedly during prolonged labors. If the hand or an instrument be introduced within the uterus during labor, an intra-uterine douche should be given. The material should be bichloride of mercury 1 : 5000, carbolic acid, thymol, salicylic acid, zinc chloride, or creolin. A glass vaginal tube is chosen for vaginal douches; a single tube for intra-uterine. The temperature should be 110° to 115° F.; the quantity two or three pints for intra-uterine, several quarts for vaginal. The uterus should be compressed after the douche, and the fluid drained from the vagina.

LUSK was in favor of prophylactic vaginal douches; intra-uterine douches were most successful where septic matter was retained in the uterus. In septicæmia, in which bacteria are the agents of poisoning, douches did no good, but only hastened the absorption of germs into the lymphatics. One intra-uterine douche, followed by an iodoform suppository, was all that is advantageous. Curetting the uterus, followed by douches, is occasionally useful. Typhoid fever he believed was not infrequently mistaken for puerperal fever.

MUNDÉ examined the uterus with the finger for septic matter if symptoms arose. If discovered, he curetted the uterus and irrigated; ergot was then given, a cold coil placed upon the abdomen, and an antiseptic pad over the vulva.

A CASE OF OBSTINATE VOMITING OF PREGNANCY.

WIESEL (*Wiener medizinische Presse*, No. 29, 1889) reports the case of a primagravida whose vomiting became uncontrollable and her condition desperate. Constipation had also been present. Rectal injections of chloral and bromide, mixed with milk and eggs, and followed by small quantities of milk by mouth, secured copious bowel movements and recovery. Sedatives were gradually withdrawn, and digestion was reëstablished by rectal feeding.

THE POSTURE AND BEARING OF THE PREGNANT WOMAN.

KUCHNOW (*Archiv für Gynäkologie*, Band 35, Heft 3) has found from a careful study of this subject that in the last months of pregnancy the bearing of the woman is of two different types; the most frequent, a backward curve of the entire body; or the posture assumed by twenty per cent. of cases, a

backward bend of the trunk only. The cervical vertebræ are straighter, the thoracic curve is greater and more projecting, the lumbo-dorsal region is straighter, the lumbo-dorsal curve is lower and flatter; the pelvic curve is sometimes lessened in the later months of pregnancy; sometimes unchanged. The hip-joints are usually carried posteriorly. The sternum projects at its lower extremity, the diameter of the thorax being increased.

THE TREATMENT OF PLACENTA PRÆVIA.

BRAXTON HICKS (*Medical Press*, August 28, 1889) would terminate pregnancy as soon as a diagnosis of placenta prævia is made, remaining with the patient until delivery is over. If the os is dilated and the placenta marginal, rupture the membranes and allow the head to descend; bring it down with forceps if needed. If the os be small and placenta over it, detach the placenta a finger's length around the os; if bleeding cease, wait; if the os does not dilate, use Barnes's bags, followed by forceps or version by combined manipulation. Combined version is indicated in undilated os when forceps and dilators are not available, when free bleeding occurs, when the fœtus is not at term. In general, Hicks has obtained good results from combined version as routine treatment. In common with the English school, he rejects the tampon.

STUDIES OF THE KYPHOTIC PELVIS.

TREUB (Leyden, 1889) publishes an atlas with plates, in which he reviews the theories of Freund and Breisky, and adds deductions from his own studies. He denies Freund's theory that the kyphotic is a persistence of the infantile pelvis, and considers it a pelvis resulting from early spinal kyphosis which has prevented development in the normal direction. Breisky's teachings as to muscular action and its results on the pelvis are endorsed. The atlas contains plates from a case of Cæsarean section for kyphotic pelvis, and plates from other specimens.

AN OBLIQUELY CONTRACTED PELVIS FOLLOWING SCLERODERMA.

TORGGLER (*Centralblatt für Gynäkologie*, No. 35, 1889) reports a case of obliquely contracted pelvis necessitating forceps delivery in a patient aged eighteen years. Five years previously she had had scleroderma of the right lower extremity, in consequence of which atrophy and non-development of the pelvis upon that side followed. The diagonal measurement of the pelvis showed a difference of one-third of an inch; the left hip was higher than the right.

THE TECHNIQUE OF EMBRYOTOMY.

THOMSON (*Deutsche medicinische Wochenschrift*, No. 30, 1889) reports three cases of embryotomy, and compares Braun's decapitation hook and the sickle-shaped knife of Schultz. In the first case reported the fœtus was small, the decapitation hook was easily passed about the neck, and the head was readily severed without injury to the mother. In the two remaining cases the fœtus was large and firmly impacted, the decapitation hook could not be passed

about the neck but slipped over the thorax or shoulder, and it was necessary to use Schultz's knife to sever the tissues, completing it by the hook. The knife must be very sharp to be efficient. Thomson's cases aggregate eleven in which Schultz's knife has been used advantageously. The hook is sufficient in cases where the fœtus is small, but where a large fœtus is firmly impacted the knife decapitates more quickly and easily.

FIVE CASES OF EXTRA-UTERINE PREGNANCY.

BARSONY (*Centralblatt für Gynäkologie*, No. 22, 1889) reports two cases of extra-uterine pregnancy in which the fœtal sac was accessible through the recto-vaginal septum; in one case death from septic peritonitis followed the drainage of the sac; the pregnancy was ovarian. In the other spontaneous expulsion of fœtal bones per rectum was followed by recovery. A case of tubal pregnancy was treated by laparotomy and extirpation of the fœtal sac, with recovery. A case of abdominal pregnancy treated by extirpation of the sac without drainage resulted fatally.

KÉZMARSKY adds the notes of a medico-legal case seen post-mortem where interstitial pregnancy had ruptured through the posterior wall of the uterus, the opening having been mistaken for one produced in criminal abortion.

A CASE OF RUPTURE OF THE UTERUS AND A CASE OF CÆSAREAN SECTION.

LUSK (*New York Medical Journal*, September 14, 1889) reports the case of a woman pregnant the second time at term admitted to hospital thirty hours in labor; the previous labor had been instrumental. On examination the cervix was undilated; cicatricial tissue extending from the internal os over the lower uterine segment rendered dilatation impossible. While the patient was in preparation for Cæsarean section she desired to urinate. When placed upon the vessel she strained violently, became suddenly unconscious, collapsed, and died in two hours. On post-mortem examination the uterine rupture extended from the upper portion of the cervix to the right side of the fundus; the uterine wall was about one-third of an inch thick at the rent; the upper portion of the cervix was narrowed to three-fourths of an inch in diameter by dense cicatricial tissue. This contraction was too high upon the uterus to permit discission, Cæsarean section being the only resort.

In the treatment of uterine rupture Lusk advises immediate emptying of the uterus; drainage by iodoform wicking if the rent be incomplete; if complete, laparotomy, closure of the peritoneal covering of the uterus, and drainage, or amputation of the uterus.

He also reports a case of markedly kyphotic pelvis following a fall, with persistent suppuration and sinuses. Delivery was impossible from extreme dislocation of the uterus. Cæsarean section (Sänger) was successfully performed. The patient did well until the fifth day, when rapid pulse, tympanites, fever (103.5°), collapse, and death occurred. No adequate cause of death was found until large psoas abscesses were opened, originating at the carious spine. The combined weight of the lungs was eleven ounces. The child survived. Lusk questions whether uterine amputation would not have saved the patient.

THE CAUSES AND TREATMENT OF RUPTURE OF THE UTERUS.

PISKACEK (*Sammlung medicinischer Schriften*, ii., Wien, 1889) contributes an interesting pamphlet to the literature of this subject. In addition to what is commonly known of the causation of uterine rupture the writer has observed that longitudinal rupture is caused by force exerted upon one side of the cervix only, while such force supplemented by a partial turning of the uterus on its axis produces a transverse or stellate rupture.

The prophylactic treatment of this complication consists in placing the patient on that side toward which the presenting part is turned, adjusting the uterus so that its long axis coincides with that of the pelvis, retaining it by pads and bandage, and making pressure upon the abdominal wall at the point where rupture is imminent.

In incomplete rupture of the uterus, with hemorrhage, the vagina should be tamponed with iodoform gauze, and the tampon should be gently inserted, if possible, against the site of the partial rupture. The fundus should be grasped in one hand, and the thumb and fingers of the other should compress the uterine arteries against the pelvis, pressure being also exercised upon the abdominal aorta by this manipulation, which must be continued indefinitely, until hemorrhage is checked.

Complete rupture is most frequent upon the anterior aspect of the cervix and lower uterine segment, the prognosis being least favorable. The most successful treatment for complete rupture is drainage by iodoform wicking, the results being 12 per cent. better than those of laparotomy. When such cases are brought for treatment the child should be at once delivered if still *in utero*, the placenta should be removed manually, as by expression it may be forced into the abdominal cavity. The vagina should be thoroughly douched with thymol, 1 to 2000, or carbolic acid, 2½ per cent., the douche point being accompanied by the finger of the obstetrician to secure the return of the fluid. Iodoform wicking should then be inserted just through the rupture; the vagina tamponed with iodoform gauze, and a binder and compresses placed over the uterus. Should abdominal distention occur, the intestines are thoroughly irrigated and stimulants given. The vaginal tampon is renewed daily, and the douche given. Laparotomy is not commonly indicated, and is most successful when uterine amputation is performed.

A detailed report of 7 cases of rupture of the uterus from Breisky's clinic is given, 4 of which recovered, while 3 died: 5 of the cases were treated by drainage with iodoform wicking, of which 4 recovered. [The pamphlet in question will well repay thorough perusal.—ED.]

THE CAUSES AND TREATMENT OF POST-PARTUM HEMORRHAGE.

GRENSER (*Centralblatt für Gynäkologie*, No. 30, 1889) treated successfully twenty severe cases of hemorrhage after abortion and labor by thoroughly emptying the uterus; bandaging the extremities; keeping the patient horizontal; injecting ether under the skin repeatedly, and also transfusing into the cellular tissue saline solutions.

LEOPOLD, in his clinic, did not remove the placenta for an hour after labor unless hemorrhage occurred. He had found the partial attachment of the placenta to the lower uterine segment a frequent cause of hemorrhage,

the upper portion of the placenta remaining firmly attached; while the lower portion separated from the lower uterine segment which bled freely. The retention of an additional lobe of placenta is also a cause of hemorrhage. In hemorrhage after abortion he dilated the cervix, if necessary; emptied the uterus, and touched the interior with cotton dipped in iron; the injection of iron he considers most dangerous.

THE TREATMENT OF POST-PARTUM HEMORRHAGE.

MISRACHI (*Bulletin Général de Thérapeutique*, August 30, 1889) reports several cases of hemorrhage at various periods after labor in which intra-uterine injections failed to arrest the flow. Scraping the endometrium with a straight scraper, the blade of which was corrugated transversely, expelled fragments of placenta and clots, after which the hemorrhage ceased. A spiral brush was also used to cleanse the endometrium with advantage.

THE TREATMENT OF UTERINE COLIC BY ANTIPYRIN.

MISRACHI (*Archives de Tocologie*, No. 8, 1889) reports his results in treating uterine colic with antipyrin in fifty-six cases. In doses of from fifteen to thirty grains it was prompt and efficient; hypodermically, seven and a half grains gave good results. After-pains were relieved in this manner, and painful uterine contractions following the use of ergot.

IDIOCY FOLLOWING THE USE OF THE FORCEPS.

WINKLER and BALLAAN (*Centralblatt für Gynäkologie*, No. 34, 1889) report two autopsies upon idiots in whom cerebral atrophy had followed pressure by the forceps at birth. Examination of the heads of twenty-five living idiots showed in six the marks of pressure on both sides of the cranium. In one autopsy general well-marked cerebral atrophy was found; the indentation in the skull was one-twelfth of an inch deep and an inch wide; the results of compression at this point were very evident in the cerebral tissues beneath.

OBSTETRIC PRACTICE IN THE MATERNITY OF LARIBOISIÈRE.

PINARD (*Annales de Gynécologie*, August, 1889) reports his results in 12,580 labors, the total mortality being $\frac{74}{100}$ of 1 per cent., mortality from septic infection $\frac{39}{100}$ of 1 per cent. Antisepsis is practised by 1 to 4000 solution of biniodide of mercury and a saturated watery solution of naphthol. Oakum pads dipped in bichloride of mercury are used to receive the lochia. Lemon juice has been employed in place of silver nitrate to prevent ophthalmia; the cord is dressed by a dry dressing of mercurialized cotton.

THE MORBIDITY AND MORTALITY IN PARTURITION.

Students of obstetrics will find interesting statistics of the morbidity and mortality of parturition in modern times in EHLER's extensive tables of death-rate in Berlin and the German Empire among parturients. The steady diminution in septic and general mortality is strikingly shown, and the advan-

tages of hospital discipline in preventing infection are apparent. Septic mortality is now less than 1 per cent. in a vast average of cases under varying surroundings; general morbidity is $3\frac{1}{2}$ per cent., and of the patients who suffer disease in childbed 1 in 3.72 perishes. There remain for study and improvement in results nephritis and tubercular infection in pregnant women, and the next decade may show gains resembling the lessening of septic mortality. These tables are published in the *Zeitschrift für Geburtshülfe und Gynäkologie*, Band xvi. Heft 2.

THE TREATMENT OF OPHTHALMIA NEONATORUM BY NAPHTHOL.

BUSCARLET (*Archives de Tocologie*, No. 7, 1889) reports the prophylactic treatment of ophthalmia at the Paris Charité as follows: For the mother, vaginal antiseptic douches during labor, bichloride of mercury 1 : 2000, or β -naphthol 1 : 2500 or 1 : 5000. The child's eyes are touched with solution of silver nitrate 1 : 100 or 1 : 50. For simple purulent ophthalmia the eyes are douched every hour by day, and every two or three hours by night with

β -Naphthol	grs. 6.
Alcohol	$\bar{3}$ 3.
Distilled water	1 quart.

while the eyes are covered with compresses wet in the solution. In gonorrhœal ophthalmia the conjunctivæ are cauterized with silver nitrate solution 1 : 50 or 30 every twelve hours. Naphthol douches are continued, given by a fountain syringe, with compresses.

ENCEPHALOCELE AND ECTOPION CORDIS CAUSED BY AMNIOTIC ADHESION.

BROCA (*Annales de Gynécologie*, September, 1889) reports an interesting monstrosity in which a bridle of connective tissue extended from a large parieto-encephalocele to the amnion, and a second similar band connected an ectopic heart with the amnion. Cardiac pulsations persisted for several hours after birth, affording an opportunity for observing the heart's action. The sternum, portion of the skull and of the lower jaw, were lacking. The fœtus was female, and the hymen could be plainly seen to develop from the vagina and not from the vulva. Fully illustrated notes of the dissection are appended.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

ADHESION OF THE OMENTUM TO THE SYMPHYSIS PUBIS AS AN INDICATION FOR LAPAROTOMY.

HOWITZ (*Centralblatt für Gynäkologie*, August 3, 1889) states that he has observed several cases in which he performed laparotomy for the relief of

severe pain attributed to disease of the adnexa, and found adhesions between the omentum and the posterior surface of the symphysis pubis; the pain was entirely relieved by simply detaching the adhesions. The patients were under observation sufficiently long to demonstrate the fact that the relief was permanent.

In one instance he diagnosticated the presence of this condition before opening the abdomen. The patient was thirty-six years of age, and had been married for fifteen years without becoming pregnant. She had suffered from pains in the abdomen since the age of seventeen, and had been treated for ulcer of the stomach, as well as for pelvic trouble; massage, pessaries, etc., had been tried in vain. She vomited incessantly, had become much emaciated, and was never free from abdominal pain. On performing laparotomy the writer found that the uterus was retroflexed and adherent, and that the adnexa were simply congested, but the omentum was adherent to the symphysis, the stomach in consequence being drawn downward, so that its greater curvature was on a level with the anterior superior iliac spine. The adhesions were separated and the abdomen was closed without disturbing the pelvic organs. Four months after the operation the patient remained entirely free from pain.

The writer infers that in many cases the relief from pain experienced is due more to the separation of adhesions than to the removal of the diseased appendages. Since the removal of the tubes and ovaries under these circumstances is often very difficult, it may sometimes be sufficient simply to break down the omental adhesions.

[While we long since expressed the opinion that the presence of peritoneal adhesions probably accounts for the severe pelvic pain which is invariably ascribed to diseased tubes and ovaries, and that the relief experienced after the removal of the latter might be ascribed to the separation of these adhesions, we do not see why attachment of the omentum alone should give rise to such marked symptoms, which might be confounded with those due to pelvic disease. From inference, as well as from observation, we are inclined to believe that adherent intestines would give rise to more severe pain than would an imprisoned omentum.—ED.]

THE INTRA-PERITONEAL INJECTION OF SALT SOLUTION IN CASES OF SEVERE HEMORRHAGE.

KÜSTNER (*Deutsche med. Wochenschrift*, 1889, No. 17) reports the following case illustrating the necessity of resorting to vigorous treatment in the presence of profuse intra-peritoneal hemorrhage. Laparotomy was performed for the removal of a cancerous growth of the ovary, the operation being difficult and prolonged. Four hours and a half afterward the patient exhibited signs of internal hemorrhage; the wound was reopened and the cavity was found to be full of blood. The pedicle was re-ligated, the abdomen was washed out and the patient's condition at first improved, but she soon grew worse. In three-quarters of an hour she became so weak that thirty-one ounces of saline solution were injected into the median cephalic vein. The pulse, which could not be felt before the injection was given, improved, but the patient again collapsed and became pulseless. The abdominal cavity was re-

opened and forty-seven ounces of the same solution were injected into it. The patient was then comatose, but she soon after revived, the pulse could be felt, and she improved rapidly. After a normal convalescence she was discharged from the hospital on the twenty-second day.

The writer urges that in such desperate cases we ought to reopen the cavity and clean out the blood-clots, even if the hemorrhage has ceased spontaneously, since their presence will expose the patient to the subsequent risk of sepsis. When the patient is pulseless and the blood has almost ceased to circulate, it is idle to resort to intra-venous injections; at least two quarts of saline solution should be injected into the peritoneal cavity, as the peritoneum will absorb it very quickly.

[Although the principle involved in this case is no new one, it confirms in a striking manner the value of irrigation of the peritoneal cavity, which not only secures cleanliness, but also restores to the circulation a certain amount of fluid which has been withdrawn from it. This suggests the propriety of leaving some water in the cavity after irrigation, especially in cases in which there has been profuse hemorrhage, instead of following the usual custom of carefully removing all of it. We have seen no ill effects follow this practice where due antiseptic precautions were observed.—ED]

THE SURGICAL TREATMENT OF TUBERCULOSIS OF THE PERITONEUM.

F. SPAETH (*Deutsche med. Wochenschrift*, 1889, No. 20) has collected sixty-four of these cases in which laparotomy was performed, from the analysis of which he arrives at the following conclusions:

1. In primary tuberculosis of the peritoneum, where none of the viscera are involved, laparotomy is a curative measure.
2. When the pelvic organs are also affected operative interference has not resulted favorably, whether the diseased organs were removed or not.
3. If the disease originates in the intestine operative treatment is simply palliative.
4. When the genital tract is primarily affected the operation should be performed as early as possible. We are rarely able to make a bacteriological diagnosis in these cases.
5. Primary bacillary tuberculosis of the peritoneum is much less frequent than has hitherto been supposed, hence the diagnosis must always be received with caution.

INTERMITTENT HYDRONEPHROSIS.

LANDAU (*Berliner klin. Wochenschrift*, 1888, Nos. 47 and 48) reports four cases in which he discovered a fluctuating tumor in the hypochondrium, which suddenly disappeared and subsequently reappeared. In one instance the diagnosis was confirmed by laparotomy, in the three others by explorative puncture. He attributes the condition to a bend or twist in the ureter, especially when the latter emerges from the renal pelvis at an acute angle. It may be due to abnormal mobility of the kidney.

The symptoms attributed to this condition are rather vague. The patient complains of cardialgia and nausea, sometimes associated with pain over the right lobe of the liver. A variation in the amount of urine voided is noted. Sometimes after an attack of pain in the region mentioned a large quantity of clear, watery urine may be passed. On examination a cystic tumor is felt at

the site of the kidney, the fluid removed from which by the aspirator-needle contains urinary constituents. In some cases the contents of the cyst can be squeezed out into the ureter, and the patient soon after passes a large quantity of urine. The treatment consists in aspirating the cyst and fixing the kidney if it is movable. If the symptoms are urgent a fistula may be established and after the sac has shrunk the ureter may be reopened by the probe, so that the fistula may heal; or the unopened sac may be sutured so high up that the ureter cannot be twisted or bent again.

MANUAL EMPTYING OF THE BLADDER.

HEDDAEUS (*Berliner klin. Wochenschrift*, 1888, No. 43) suggests the following procedure in cases of paralysis of the detrusor urinæ:

The patient being on her back with the thighs flexed, the operator stands on her right side facing her, placing his left hand on the right side of her abdomen, and his right hand on her left side; the tips of the thumbs are opposed, while the fingers make steady pressure over the bladder in a direction downward and backward, so that the fingers are approximated to the thumbs. When the organ is partially emptied the same manœuvre is repeated. Or, the physician may stand with his back to the patient, and placing the ulnar edge of each hand close to Poupart's ligament, may compress the bladder with his thumbs; the latter method is preferable when the organ is partly filled. It may be practised in any case in which catheterization is indicated, except when pregnancy or acute inflammatory troubles are present. It is especially valuable in ischuria following parturition. Great care should be exercised if the bladder is overdistended.

AMYLOID DEGENERATION OF AN INTRA-UTERINE POLYPUS.

STRATZ (*Zeitschrift für Geburtshülfe u. Gynäkologie*, Band xvii., Heft 1) reports a unique case of this character. Microscopical examination of a small fibrous polypus removed from the cervical canal showed that its vessel walls had undergone general amyloid degeneration. The patient was in robust health, and exhibited no evidences of visceral disease. A similar condition was noted by Buron in a fibroma of the larynx, but never before in a neoplasm of the genital tract. The cause is entirely unknown. Practically the discovery of such a change in a uterine polypus would suggest the advisability of investigating the abdominal viscera with reference to the possible existence of amyloid disease elsewhere. How far we are justified in feeling alarm on this account is uncertain.

[As the writer says, we so seldom make a careful examination of ordinary polypi that many interesting conditions like the above are doubtless overlooked.—ED.]

THE MANNER IN WHICH MÜLLER'S DUCTS OPEN INTO THE SINUS UROGENITALIS.

BIERFREUND (*Zeitschrift für Geburtshülfe u. Gynäkologie*, Bd. xvii., Heft 1), from the microscopical study of ten embryos, arrives at a somewhat different conclusion from former investigators, *i. e.*, that Müller's ducts divide at their

peripheral ends. In four instances they had separate mouths. The lumen of the duct was seldom patent at its mouth, that is, it seemed to preserve its original solid condition. It seemed rational to infer that in this portion the lumen was originally patent, but that it became obliterated in consequence of hypertrophy and casting off of the epithelial lining. This condition was also observed at the terminal portions of the Wolffian ducts. At the middle of foetal life it was quite common to find the lowest section of the genital canals blocked by old epithelial cells. In some cases the failure of Müller's ducts to end in the sinus urogenitalis might be ascribed to an individual peculiarity in development. In over one-half of the embryos examined by the writer he found separate openings of the ducts, contrary to Michálcovicz, who states that they always unite before entering the urogenital canal. Probably the former is the more common condition. This communication is established as early as the beginning of the third month of foetal life.

CYSTIC MYOMATA OF THE UTERUS.

SCHAUTA (*Prager Zeitschrift für Heilkunde*, Band x. Heft 2) recognizes five distinct varieties of fibrocysts, viz.: 1. Myxomyomata, resulting from cedematous softening of the interstitial tissue of fibrous tumors, accompanied by proliferation; 2. Soft myomata, in which there is general softening, resulting in the formation of cavities together with atrophy of the muscular fibres, the cavities not being real cysts, since they have no distinct lining membrane; 3. Lymphangiectatic myomata, in which there is general dilatation of the lymphatics; 4. Telangiectatic myomata, containing dilated bloodvessels, but no cavities; 5. A rare form (only one case has been described), in which there are cavities lined with ciliated epithelia.

The writer calls attention to the fact that these tumors are always of the subserous variety, hence their circulation is more easily interrupted, leading to retrograde changes. They are often mistaken for ovarian cysts. Explorative puncture, which is commonly recommended as a diagnostic measure, is dangerous on account of the liability to suppuration of the growth; Fehling reports eleven cases of puncture, ten of which terminated fatally from this cause.

ATROPHY OF THE UTERUS AND OVARIES.

KLEINWÄCHTER (*Zeitschrift für Geburtshilfe u. Gynäkologie*, Band xvii. Heft 1) observed this condition in 1.23 per cent. of his gynecological cases. He believes that it has not the importance which is usually assigned to it, and is often unaccompanied by symptoms. Even when marked the symptoms are only those of chlorosis; in fact, the latter is the primary trouble. Atrophy of the uterus does not necessarily cause amenorrhœa; the patient may menstruate normally, if her ovaries are not affected.

The prognosis of the individual case depends entirely upon the condition of these glands, since, if they are atrophied, menstruation is absent and there is absolute loss of functional activity, causing permanent sterility. An exception to this is offered in the case of inflammatory conditions following parturition, which may lead to temporary atrophy of the ovaries through the pressure of exudates; the same temporary loss of function may result from

wasting diseases. Concentric atrophy occurs more rapidly and reaches a higher grade than excentric. As in many other pelvic affections, it is impossible to reconcile the clinical with the anatomical condition. Since the uterus and ovaries are influenced by many general affections, it is often impossible to say whether the trouble is primary in these organs or not.

Atrophy of the uterus is not rare, but our attention is only called to it when it is sufficiently advanced to give rise to marked symptoms. If patients with wasting diseases were examined with reference to this point, it would frequently be found that the uterus and ovaries had become atrophied.

SLIGHT CYSTIC DEGENERATION OF THE OVARY.

BULIUS (*Centralblatt für Gynäkologie*, August 10, 1889) has examined a number of ovaries which presented microscopically a minor degree of cystic degeneration, with the purpose of ascertaining if this condition is really the result of pathological changes, and has come to the conclusion that it is clearly due to various irritating influences, especially to the presence of ovarian and uterine tumors and peritonitis. Anatomically while the follicles are always changed, the stroma is sometimes normal and sometimes not, whence the inference that the follicular degeneration is occasionally primary. The author has examined numerous small cysts, which from their appearance and brownish contents might be supposed to originate from the corpus luteum, and finds from their structure that they are simply dilated follicles into which blood has been effused.

THE INTERNAL CROSSING OF THE OVUM.

SCHAEFFER has an elaborate paper on this subject in the *Zeitschrift für Geburtshülfe u. Gynäkologie*, Bd. xvii. Heft 1, in which he reviews and criticises the four reported cases, all of which he shows to be hypothetical, since there were several sources of error, viz.: It was not positively demonstrated that the body found in the ovary was a true corpus luteum, and that the corresponding tube was occluded at its distal end. The writer arrives at the conclusion that on theoretical as well as on physical grounds it is impossible that the ovum should traverse one tube, enter the uterus, and cross over into the opposite tube, and that up to this time no positive proof exists that this has ever occurred in a single instance.

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TETANY.¹

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VERY few observations have been published in America on the extremely interesting disease commonly known as tetany. Drs. Henry Hun, of Albany; Carpenter, of Pottsville; Lyman, of Chicago; and J. Lewis Smith, of New York, have each reported one or more cases. It has been my fortune to have observed a large number of cases in Vienna during the winter of 1883 and 1884, and to have had under observation during the past three years a case which presents many points of exceptional interest. I will first give a brief description of the clinical course of this case.

The patient is a male, aged thirty-nine. His complaints when he first came under observation were *diarrhœa* and "spasms of the face, arms, and legs." He has been troubled with *diarrhœa* for ten years, and with spasms of an intermittent character for the past eight years. During the late American civil war he served as a private soldier in a number of the Virginia campaigns. During this period he had several attacks of malarial fever, and for a period of eighteen months he suffered from a mild form of chronic *diarrhœa*. He never had either syphilis or rheumatism, and never drank to excess. The family history is unimportant.

The patient is tall, emaciated, and anæmic, with an anxious, careworn expression. For the past eight years he has been troubled with the attacks of tetany. Usually the first subjective symptom of their appearance is double vision. Then the thumbs become strongly adducted and

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opposed, while the fingers are adducted and semiflexed. These contractions gradually increase in severity day by day up to about the tenth day, when they somewhat suddenly begin to decline, and the parts become normal twenty-four hours after.

When the attacks are what he calls severe, the adductors of the upper arm become involved, bringing the arms crossed in front of the chest, with the forearms semiflexed. For some hours before and during the whole period of tetany he has a disagreeable feeling of numbness in his fingers. The dorsum of the hands swell and they are extremely painful. The pain is especially severe when an attempt is made to straighten the contracted muscles. The muscles of the face are also frequently the seat of contractions, the upper lip being usually drawn to the left and upward, and the lower to the right and downward. The facial muscles are also the seat, during the period of tetany, of fibrillary twitchings. The muscular contractions only occasionally affect the muscles of the lower extremities. When affected, the feet and toes are in a state of plantar flexion, the feet being turned inward and the thighs adducted.

The galvanic irritability of the nerves is found to be greatly exaggerated during the period of tetany. The following may be taken as an average result :

	Normal period.	Tetany period.
Facial	3.00 m. a.	0.25 m. a.
Radial	5.00 "	1.00 "
Median	4.25 "	0.50 "
Ulnar	3.50 "	0.50 "

During the period of tetany usually galvanization of either facial produced lively contractions on closing the kathode with a measurement of not more than 0.25 of m. a., while after the attack passed away it was necessary to employ 3 m. a. to induce a similar contraction. An anode opening tetanus is readily induced by a strength usually not exceeding 3 m. a. A strength of current necessary to induce a contraction during the quiescent period was sufficient in the tetany period to cause a distinct tetanic contraction. There were never noticed any signs of the reaction of degeneration, the KSZ. being always found more marked than the AOZ.

The difference between the reaction to faradization of the muscles during the normal and tetany periods is not very marked. In fact, the interossei require a much stronger current to induce their contraction during their tetany state than after it has passed away. This is no doubt owing to the oedematous tissues increasing the resistance. The mechanical irritability of the muscles when in a state of tetany is greatly exaggerated. The same holds true of the nerves innervating the affected muscles. Pressure on the vessels does not appear to increase the intensity of the muscular contractions. The muscles, although flabby, are in a fairly nourished condition.

During the period of tetany, the knee-jerk is greatly exaggerated, but after it has passed it is always difficult, and at times impossible, to induce contraction of either quadriceps, when the patellar tendons are percussed. The same holds true of the biceps and triceps reflexes. There is nothing definite to be made out in regard to any of the superficial reflexes.

Vasomotor phenomena are frequently noticed. Mention has already

been made of the swelling of the back of the hands. Herpetic eruptions on the fingers are occasionally seen also.

The tongue is constantly found in a raw-looking state.

During the intervals of freedom from the attacks, he suffers from diarrhœa, which moderates when the tetany makes its appearance. The stools are copious, semi-fluid, frothy, and look like pea-soup. The abdomen is usually distended. During the attacks, the urine has a high specific gravity from an excess of urea. It contains also a great excess of indican. It is free, however, from both albumin and sugar. Jaundice frequently is present; there is no other evidence, however, of disease of the liver.

The spleen is normal in size. An examination of the blood reveals nothing abnormal. No evidence of any thoracic disease.

About one year after this patient came under observation, the following additional symptoms were noticed:

A complaint, not only during the attacks, but also in the intervals, of general numbness. There is noticed a difficulty in speech. He is able to articulate well, but on attempting to answer a question, it takes him some time to do so, and when he begins to speak, especially if any thinking is necessary, the speech is slow. The œdema, which was formerly confined to the back of the hands, is now more or less general, but is especially marked in the face. There is no pitting of the tissues, however. There is no trace of the thyroid gland. The anæmia has also increased in intensity.

These symptoms resemble closely those of myxœdema. Against that assumption we have the fact that there has been no progress whatever during the past two years, and this is hardly compatible with what is known to be the clinical course of myxœdema. At one time it appeared as if we were going to have a myxœdema engrafted on a tetany.

The case is undoubtedly one of tetany, but whether we have in addition myxœdema, or not, time alone will tell.

Steinheim, in 1830, was the first to give a true clinical description of tetany. Corvisart, in 1852, was the first to propose the name by which it is now universally known. It is, however, mainly to the observations of Trousseau, Erb, N. Weiss, and others that we have been made acquainted with many of the more important features of this remarkable disease.

There are three distinct forms of this disease—forms which differ, in the causes that give them origin, in their course, and in their prognosis, but little in the clinical pictures which they present. By far the most common variety of this disease is what is known as rheumatic or epidemic tetany. On the continent of Europe, especially in Paris and Vienna, distinct epidemics occur. In Vienna hardly a winter passes without such an occurrence. In the winters of 1883 and 1884 a very severe epidemic occurred in the latter city.

The course of the disease when it occurs as an epidemic, is acute—

usually not lasting over two or three weeks—fatal cases being very exceptional. Extensive epidemics occurred in Paris in the years 1855 and 1876. In England and America no epidemics of this disease have been described.

A second variety of tetany, which is more chronic, is due to either chronic diarrhœa, prolonged lactation, or other debilitating influences. Except in being more chronic, this form differs but little from the epidemic variety. Recovery nearly always occurs. A third form of tetany follows the removal of enlarged thyroid glands. A very considerable number of cases of tetany following this operation are now on record. Up to May, 1883, Billroth performed 78 operations for the removal of enlarged thyroids, and in 13 tetany followed in the course of a few days; 6 of these 13 cases proved fatal. Two of the fatal cases ran a course of upward of one year, while the remaining four terminated within two weeks.

There is a very marked difference between the course of tetany following extirpation of the thyroid and that due to debilitating and epidemic influences. The former is a much severer type, being frequently fatal, while the latter is seldom or never fatal. A fourth variety of tetany is also distinguished by its fatal tendency. I refer to that which occurs in cases of dilatation of the stomach. Kussmaul, Gerhardt, Dujardin-Beaumez, Müller, and others, have reported such cases. Müller has collected eight cases of tetany occurring during the course of dilatation of the stomach, with a mortality of sixty-six per cent. Judging from these statistics, tetany due to this cause is even more fatal than that arising from removal of the thyroid gland. I have purposely excluded the consideration of what is commonly called infantile tetany, as it appears to me that true tetany is an exceptionally rare disease in infancy. If we are to include, as many observers do, all cases of carpo-pedal contractions under the name of tetany, the disease is much more frequent among children than adults. Clinically there is a marked difference, however, between the carpo-pedal contractions so frequently seen in conjunction with laryngismus, and tetany.

1. The tetany of adult life is essentially an intermittent disease, while in the so-called tetany of infant life the contractions are permanent until recovery takes place. They may be more intense at one time than another, but they never completely disappear.

2. The carpo-pedal contractions of infancy appear in a very considerable number of cases to be due to cerebral causes, as eclampsia is a very frequent complication. There is no doubt that true cases of tetany do occur in childhood; what I wish to lay stress on is, that they are very rare, and that it is an error to say that every case in which we have carpo-pedal contractions is a case of tetany.

EXPERIMENTAL TETANY IN ANIMALS.

When the thyroid gland is removed from cats and dogs, a series of symptoms set in in a few days, to which the name of experimental tetany has been applied. The first symptom usually noticed is a peculiar appearance of the eyes, due to a pushing forward of the membrana nictitans on the inner and under surface of the bulb, from tetanic contraction of the internal eye muscles. Simultaneous with this contraction of the eye muscles, there appear fibrillary tremors of the muscles of the extremities and face, and occasionally of the tongue. In some cases these tremors are so marked that it is impossible for the animal to stand erect, at other times they are so weak that it is with difficulty that they can be perceived. In addition to the fibrillary tremors, there is tetanic contraction of the muscles of the extremities. The muscular phenomena described alternate with periods when the animal remains quiet. The respirations are frequent and superficial. The temperature is not increased.

In most animals, after the eighth day, a suppurative catarrh of the conjunctiva sets in, which finally leads to implication of the cornea and its perforation. The death of the animal soon follows, either suddenly from tetanic contraction of the glottis or diaphragm, or more slowly from exhaustion.

In a very large number of thyroid removals in dogs, Fuhr was unable to find any constant changes in the internal organs. Neither the brain nor spinal cord presented any marked changes. The tissues in the neighborhood of the thyroid gland were carefully examined and were found normal.

Exceptionally, a dog may live after complete removal of the thyroid gland. Rabbits, on the other hand, usually recover from the operation, although liable to be affected by the muscular contractions. Man appears to stand midway between these two classes of animals, so far as his power of withstanding the removal of the thyroid is concerned.

The symptoms detailed as following the removal of the thyroid in the lower animals, bear a striking resemblance to tetany as it appears in man; that they are essentially the same disease is extremely probable. A valuable proof of their identity has been pointed out by Schwartz. In all his cases—six in number—he found that both the galvanic and faradic reactions were greatly increased. The reaction of the peroneal nerve to galvanism was so marked that he often found muscular contraction induced by a strength of current not measurable by our ordinary clinical galvanometers; AOTe. and KsTe. were readily brought out by a very weak current.

Of the many different forms of cramps that affect the muscles in man, tetany is the only one in which there is a marked increase in the electric

irritability of the nerves, with the possible exception of Asiatic cholera. Its presence, then, is of great diagnostic importance, and leaves little room for doubt that the muscular contractions which follow the removal of the thyroid in animals are of the same nature as those which follow a similar operation in man, and also similar to the same disease that occurs epidemically, and from the other causes already mentioned.

The Morbid Anatomy of Tetany.—In the few cases where a histological examination of the nervous structures has been obtained after death, no lesion to account for the symptoms present during life could be discovered.

The slight changes described by Weiss as having been found by him in the cervical cord, are considered by all later observers as negative, a few swollen ganglion cells being the only abnormality described by this observer. Langhans found a periarteritis and periphlebitis in the white commissure and anterior horns of the cervical and lumbar enlargements in a woman who died at the age of forty-eight, after having suffered for some time from tetany. Similar vessel-changes are, however, not infrequent at this age, and, therefore, cannot be taken as in any way distinctive of tetany. Schultze and Beyer have each had in several cases opportunities for making a thorough examination after death of the central and peripheral nervous system, and with negative results in every case.

We may therefore conclude that, as far as we know at present, there are no anatomical lesions in cases of tetany. The same is true of the tetany induced in animals by removal of the thyroid gland. Judging from the clinical course of the disease, these negative results are what we would naturally expect.

Before discussing the probable nature of the disease, it will be in place to glance at the present expressed opinions as to the cause of the experimental tetany of animals after removal of the thyroid glands. With but very few exceptions, every recent experimenter in this field has arrived at the conclusion that the tetany is directly brought about by the removal of the gland itself, and that it has nothing whatever to do with injury of the nerves in the neighborhood. The very recent experiments of Fuhr, Weil, and Schultze establish this, I think, beyond doubt. An interesting experiment performed by Fuhr shows that simple irritation itself does not bring about any of the symptoms of tetany. He injected a hypodermatic syringe of a 10 per cent. solution of nitrate of silver between the gland and its capsule; severe and extensive inflammation of the gland and neighboring structures followed, but at no time were there present any fibrillary tremors, muscular contractions, or other symptoms indicative of tetany.

It is a well-established fact that the removal of one gland does not bring about tetany, but if, after the wound is completely healed, the remaining gland is removed, the symptoms of tetany quickly develop,

and we then have the usual lethal course as seen when the two glands are removed at the same time.

Weil has also shown that if a portion of each gland is removed the result is negative, while the usual symptoms quickly make their appearance when the glands are completely removed.

I think there can be no other conclusion after the consideration of the above facts, than that the cause of tetany in animals is due directly to the removal of the thyroid glands. And no other conclusion is tenable in regard to the tetany which follows extirpation of the thyroid in man.

As the removal of the thyroid glands, both in man and animals, brings about a certain train of nervous symptoms, it follows that these glands have some important relations to the nutrition of the nervous system: whether this function consists in the removal from the blood of matters which would be injurious to the nervous system if allowed to circulate, it is difficult to determine. Experiments performed by Ewald, of Strassbourg, lend great probability to this view. He injected a number of dogs with the freshly expressed juice from the thyroid glands of healthy dogs, and invariably found that the animals became soporose and cataleptic.

To explain how causes, seemingly so diverse in their operation, as rheumatic influences, diarrhœa, pregnancy, lactation, and removal of the thyroid glands, can induce similar symptoms is very difficult. The active cause in the case reported is, no doubt, in some way due to the diarrhœa; but is the disease induced through impoverishment of the nerve centres, or through the peripheral irritation, or from the absorption of putrid products?

It appears reasonable to conclude that in all cases of tetany we have to do essentially with an unstable condition of the nervous system, a condition which readily reacts to slight peripheral influences. In the great majority of cases the disease is connected with some directly debilitating cause.

No doubt peripheral irritation is an active factor in a considerable proportion of cases. Müller reports two cases of tetany occurring in simple dilatation of the stomach, and where, after death, this organ was found to be twisted on its axis.

I am unable to advance any facts as lending probability to the view that tetany is brought about by the absorption of the products of putrid decomposition.

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ON THE USE OF ANTIPYRIN IN MALARIAL FEVERS.

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THE antithermic properties of antipyrin have now been recognized for such a long period of time that it may seem superfluous at this date to call attention to them, and yet there is a class of cases to its use in which attention has been little directed, and in which I believe it has not hitherto been much employed. In this drug, however, we possess a remedy which, in my experience, is absolutely certain to cut short the duration of a paroxysm of malarial fever, and, when used in combination with quinine, shortens the whole attack. (When I use the word certain, I must point out that I refer to an attack of pure malarial fever, no matter how severe; that is to say, an attack uncomplicated by any other distinct disease, such as hepatitis, enteritis, etc. In such cases antipyrin will not give the same results.)

Diaphoretics, from the simple infusion of some garden herb, culled from a native's garden, or the good, old-fashioned mixture of liq. ammoniæ acetatis and sp. ætheris nitrosi, to the more active remedies, jaborandi or Warburg's tincture, have each found their advocates, and have been more or less successful. But to each of them there is the objection that, however successful they may be in the majority of cases, yet every now and then we meet with some case which baffles all our efforts, where the temperature remains persistently high, and where no drug seems to possess the power of producing diaphoresis and of diminishing the pyrexia. It is in such cases as these, as well as the simpler forms, that antipyrin is specially valuable.

One of its most striking effects when administered during the hot stage is the almost immediate feeling of relief which it affords to the patient. All those who have suffered from an attack of intermittent or remittent fever can recall the intense throbbing headache, the constant feeling of oppression, and the aches and pains in the loins and limbs which render any one position impossible for any length of time. Here the anodyne properties of the drug come into action; and, if they do not completely relieve these distressing symptoms, at least lessen them. As a result of this, the patient becomes drowsy, and after the second dose usually falls into a sound, refreshing sleep. At the same time the skin begins to feel moist, and this increases until the patient is drenched in perspiration. The temperature steadily falls, and in most cases does so until it is subnormal. The fall of temperature begins almost immediately, and the rapidity with which it sinks varies with the individual case and probably with the stage of the attack at which it is administered. In Case IV., for example, the temperature was subnormal four hours after the administration of fifteen grains only, while in Case V., with much larger doses, it took seven hours to fall from 103.8° to 99.4° . The duration of the intermission is from twelve to eighteen hours; but this probably depends upon the action of the quinine which I always prescribe *after* the antipyrin, and which intensifies the action of the latter drug, as the diaphoresis becomes more marked and the decline in temperature more rapid after its use.

Quinine alone will not do this, especially if the temperature is over 100° , and is still rising. In many such cases it is practically useless, and, in fact, seems to have an irritating effect rather than otherwise. It is when the temperature has *begun* to fall, and during the intermission, that quinine is invaluable. The combined use of these two drugs has given such satisfactory results that I have not tried antipyrin alone, except in one case, a native, where certainly cure eventually took place, although the duration of the attack was considerably longer. When we remember that antipyrin belongs to the same group of chemical substances as quinine, it would almost seem from this that it has some specific action on the malarial poison, although, of course, one case is far from conclusive.

The action of antipyrin on the pulse is variable. It generally slows and steadies it and increases its tension, while at times it has little effect.

Antipyrin is well retained by the stomach, an advantage, and by no means an unimportant one, which it has over other diaphoretics, especially in countries like the Gold Coast, where gastro-hepatic disturbances are an almost invariable concomitant of malarial attacks, and where vomiting frequently constitutes one of the difficulties of treatment.

Macalister,¹ in summing up the effects of antipyrin, states that it in-

¹ Abstract of Croonian Lectures on Antipyretics. *Lancet*, July 14, 1888.

creased skin radiation, diminished the difference between peripheral and central temperature, lowered the temperature as a whole, diminished thermogenesis, diminished the production of nitrogenous waste and, therefore, nitrogenous metabolism, and frequently, but not always, increased perspiration, while it generally slowed the heart and slightly increased the tension of the radial artery. In malarial fevers, however, the effect on perspiration is much more marked, and this, in addition to its thermolytic and thermogenetic properties, may afford an explanation of its action. Taking for granted that this class of fevers is due to a microörganism (Laveran, Marchiafava, Celli, and others), we must attribute the rise of temperature to the effects of the morbid products derived either directly from the microörganism, or from its destructive action on the red blood-corpuscles. That malaria is a disease of which the essential characteristic is a destruction of the red blood-corpuscles, is now well established; and it has recently been shown by Drs. Bristowe and Copeman¹ in a series of experimental observations on a case of paroxysmal hæmoglobinuria, that the destruction of blood corpuscles is itself sufficient to cause a rise of temperature; consequently, when we eliminate these morbid products as rapidly as possible through the sweat glands we diminish the pyrexia. This result being achieved, quinine, which is a specific poison to the malarial organism, now steps in and prevents its further development.

Probably the same explanation can be given of the well-known beneficial effects of full doses of calomel in malarial fevers, apart from the fact that quinine forms an insoluble salt with the bile,² and hence will not act until the latter is removed. The seat of blood destruction in health, and of the removal of the products of this, is the portal circulation.³ In malaria, however, the excessive blood destruction throws such a strain upon the liver that it is unable to act, and gastro-hepatic disturbances ensue. Calomel, by removing the accumulated bile, allows the liver cells to set to work on the morbid products circulating in the blood, and thus acts indirectly on the temperature.

With reference to the manner of administering antipyrin, I find that large doses are most satisfactory, and they have never in my experience been followed by bad results. Thirty grains should be given at once, and repeated in an hour or an hour and a half, and a further dose of fifteen grains may be given if required. During the intermission quinine should be given freely.

The following five cases of fever occurring in Europeans, will serve to illustrate the action of antipyrin :

¹ Lancet, August 14, 1889.

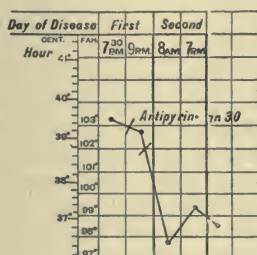
² Lauder Brunton : Pharmacy and Therapeutics.

³ Hunter: An Investigation into the Pathology of Pernicious Anæmia. Lancet, October 6, 1889.

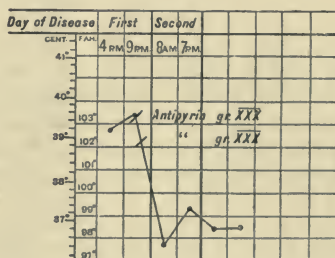
CASE I.—Patient A. B. had just returned to the coast from a six months' expedition to the interior, during which he had had an attack of fever. When I saw him at half-past seven in the evening his temperature was 103.2° . Face flushed; tongue very foul. Bowels had been moved during the day by a dose of some effervescent saline. There was slight tenderness over the spleen, but none over the liver; skin hot and dry; great headache, and pains in muscles of back and legs. Thirty grains of antipyrin were taken at 8.30 P.M. 9 P.M.: Temperature 102.8° ; skin beginning to feel moist; headache lessened and patient sleepy. Ordered thirty grains at 9.30 P.M., and at 10 P.M. quinine gr. xv, with a pill composed of pil. hydrarg., pil. col. et hy., aa gr. vj.

Second day. An effervescent saline was given at 6 A.M., and when I saw him at 8 A.M. his bowels had been freely moved; temperature 97.8° ; headache had disappeared, and patient felt better generally. Quinine gr. xv had been given at 6 A.M., and ten grains were ordered to be taken at 9 A.M., 12 M., and 4 P.M. At 7 P.M. there was only slight tendency to return of the fever, the temperature being 99.3° . Ten grains of quinine were given at 9 P.M. After this there was no return of the fever, two or three days' course of tonic treatment being all that was required to complete recovery.

CASE I.



CASE II.



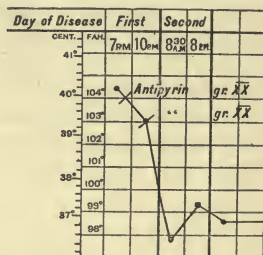
CASE II.—This case is very similar to the first one. Patient C. D. had been up in the interior for two and a half months, and had just returned to the coast. He had been complaining of a constant feeling of nausea for some days previous to the attack, pointing to some gastric disturbance with hepatic inactivity, a very common antecedent to fever on the Gold Coast. When I saw him at 4 P.M. the temperature was 102.8° . There were great feeling of discomfort, great headache, and pains in the loins and legs; tongue very foul. 9 P.M., temperature 103.2° . The medicines which I had ordered only arrived. Gave antipyrin gr. xxx, to be repeated in an hour, and afterward quinine gr. xv, along with pil. hydrarg. and pil. col. et hydrarg., aa gr. vj.

Second day. 8 A.M., patient said he slept well after the medicine, and the headache and pains disappeared. Bowels freely moved. Quinine gr. x at 8 A.M., 12 M., and 4 and 7 P.M. At 7 P.M. the temperature is 99.2° , showing a tendency toward return of fever, but otherwise patient is all right. Another ten grains of quinine to be taken. From this date there was no return of the fever.

CASE III.—Patient E. F. had had a very slight attack of fever a few

days previously, from which he had recovered, but having had the imprudence to go on duty (contrary to orders) in the afternoon, during which he was exposed to the sun, a second and severe attack was the result. Exposure to the sun is not unfrequently followed by an attack of true malarial fever, and the explanation is probably to be found in the fact that the vitality of the system is lowered, and as a result the malarial organism, which has hitherto remained dormant, is able to act upon the weakened body. In a region like the Gold Coast, where one is constantly exposed to the malarial poison, and where the system may be supposed to be saturated with it, any lowering of vitality, from whatever cause it may arise—exposure, excessive use of alcohol, etc.—is liable to be followed

CASE III.



by an attack of fever. 7 P.M., temperature 104.4°; pulse is bounding and incompressible; tongue is covered with a thick white fur; breath offensive; has been to stool once or twice to-day. There is tenderness both over the liver and spleen; constant feeling of nausea, and patient has been vomiting at intervals. Twenty grains of antipyrin were given at 8 P.M. At 10 P.M., temperature is 103°, and skin is beginning to feel moist. The same dose of antipyrin was repeated, and six grains of calomel were given. Twenty grains of quinine were ordered to be taken in an hour.

Second day. 8.30 A.M.: Patient slept well, and awoke during the night bathed in perspiration. The temperature is now 97.9°. Bowels have been moved freely. There is still a slight feeling of nausea. Ten grains of quinine were given at once, and at 10 A.M., 1, 6, and 9 P.M. 8 P.M., temperature 99.4°.

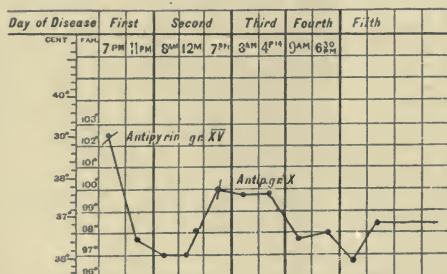
Third day. Temperature 98.7°. Patient is feeling better, but weak. From this date there was no return of fever, and tonic treatment was prescribed.

CASE IV.—Patient G. H. was a man with marked alcoholic tendencies, and the present attack I attributed to alcoholic excess two days previously. When I saw him at seven in the evening his temperature was 102.5°; his skin was hot but moist; there was considerable headache; tongue was foul and tremulous, and there was a disagreeable taste in the mouth; there was a constant tendency to vomit; tenderness over liver and spleen; pulse fast and weak. Ordered fifteen grains of antipyrin at once, and ten grains of quinine to be taken at 8 P.M. 11 P.M.: Patient has slept since my visit. Skin feels cool and moist; has been sweating freely; temperature 97.8°; headache has quite gone. There is no tendency to vomiting, but he says he had great difficulty in retaining

the antipyrin. Pulse slow and full. Gave pil. hydrarg., pil. col. et hydrarg., ãã gr. vj, and ordered twenty grains of quinine an hour later.

Second day. Temperature 97° . Patient says he had a good night; has been to stool twice. Quinine gr. x at 6 and 8 A.M., and again at 1 P.M. 12 M.: Temperature 97° ; pulse 90, full and compressible. 7 P.M.: Temperature 100° ; pulse 102; pain over liver and spleen more marked than yesterday; tongue extremely furred; skin hot and dry. Gave ten grains antipyrin at once, and fifteen grains quinine at night. Left a sleeping draught of pot. brom. and chloral, to be taken if necessary.

CASE IV.



Third day. 8. A.M.: Patient did not sleep well; vomited the sleeping draught. Temperature 99.9° ; pulse 94. Tongue very foul; the tenderness over liver and spleen continues. Quinine gr. x at 10 A.M., 1 and 4 P.M. 4 P.M.: The temperature remains the same, but patient says he is feeling better. Pulse 96° ; moderately full. Tongue clearing at edges. Quinine gr. x at 7 P.M., and gr. xv at 10 P.M. Pil. hydrarg. gr. iv. at 10. A sleeping draught if necessary.

Fourth day. 9 A.M.: Temperature 97.8° . Patient took sleeping draught and had a good night. Ten grains given at once and fifteen at 1.30 P.M. 6.30 P.M.: Temperature 98° . Has been twice to stool; tongue slightly furred; feels very weak. Quinine gr. xv at night.

Fifth day. Temperature 96.8° . Patient feeling better. The quinine was continued in smaller doses, and a mixture of arsenic, cinchona, and nux vomica prescribed.

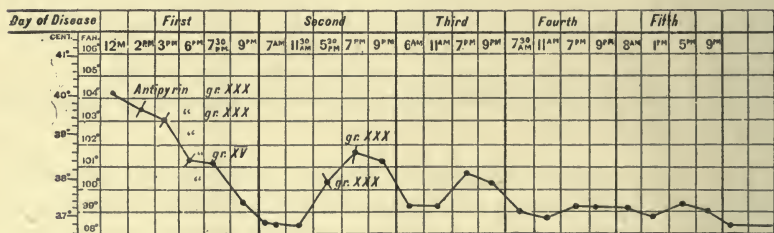
This was one of the first cases in which I had recourse to the drug, and I was somewhat chary of using the large doses which I used later. Its effect is, however, well shown on the first day, where the temperature fell from 102.5° to subnormal in four hours, and continued thus until noon on the following day. The return of the fever I think was due to my not having given sufficient quinine during the intermission, and perhaps also to the disordered state of the liver. The temperature fell at once after a second dose of blue-pill.

This was the only one of these five cases in which I had an opportunity of examining the blood microscopically, and it may be interesting to mention that I recognized several of the large pigmented bodies which Laveran describes in his *Traité des fièvres Palustres* but I was unable to

satisfy myself of the presence of the crescentic bodies or of the "filament motiles." The red blood-corpuscles varied considerably in size, became very quickly crenated, and assumed irregular shapes very readily on pressure. Occasionally a distinctly nucleated red corpuscle could be seen.

CASE V.—Patient I. K. had passed the last two months moving about in the interior, during which time he had gone through a good deal of fatiguing work, and occasionally had been much exposed to the sun. When returning from this expedition he had suffered from a severe attack of fever accompanied by diarrhœa, which left him in a very reduced and anæmic condition. The exciting cause of the present attack was said to be a chill met with on board the steamer while coming along the coast. I saw the patient about 12 noon. His temperature was then 104.2° ; pulse 100, weak, and compressible. Tongue yellow and furred, but not markedly so. There was a feeling of nausea. Bowels had been freely opened by a strong purgative, but patient is habitually constipated. There was slight uneasiness on pressure over liver, but none over spleen. Skin moist; intense headache. There was a great feeling of weakness and a sense of oppression on the chest; in fact, throughout the illness the great prostration was one of the most marked features. I ordered a hot drink until the medicines arrived from the hospital. About 2 P.M. thirty grains of antipyrin were given, the temperature then being 103.8° , but the other conditions remaining the same. There was a little tendency to weakness about this time. At 3 o'clock the temperature had fallen to 103° , and patient was feeling better and inclined to sleep. I repeated the antipyrin. At 6 the temperature had fallen to 101.4° . Pulse 82; fuller than before. Patient had been sweating freely. At 6 fifteen grains of antipyrin were given, and at 7.30 ten grains of

CASE V.



quinine. At 9 o'clock the temperature was 99.4° . Gave pil. hydrarg., pil. col. et hydrarg., ãã gr. v, and repeated ten grains of quinine. Also left a sleeping draught of pot. brom. and chloral, as patient had passed some very bad nights previously. During the day champagne was administered freely, and liquid food in the form of Liebig's extract of beef, with beef, peptonoid powder, etc., was taken.

Second day. 7 A.M.: Temperature 98.8° . Slept well, patient feeling better generally. 11.30 A.M.: Still no fever. Temperature 98.6° ; pulse 62. Ten grains quinine given at 8 A.M. and 12 M. 5.30 P.M.: Slight return of fever. Temperature 100.4° ; pulse 86; somewhat bounding.

Complained of aches and pains. Gave thirty grains of antipyrin. 7.15 P.M.: Temperature has risen to 101.8° . Patient feels very weak and despondent, and complains of difficulty of breathing and a tendency to take long breaths. Repeated antipyrin, thirty grains. 9.15 P.M.: Temperature has begun to fall and is now 101.2° ; pulse lower. Has been sweating freely. Gave fifteen grains quinine and sleeping draught, if necessary. Dietetic treatment of a stimulant character, as above.

Third day. 6 A.M.: Temperature 99.2° , at which it remained until 11, when it began to rise, attaining its maximum (100.7°) at 7 o'clock. Sixty grains of quinine were given throughout the day, and as the tongue still remained yellow and furred eight grains of calomel were prescribed.

Fourth day. Bowels freely moved. Temperature 99° in the morning, and remained low all day, only rising to 99.4° in the evening. Fifty grains of quinine given throughout the day.

Fifth day. Temperature remains about 99° . Patient improving, but the weakness remains. Forty grains of quinine given. After this, patient had no recurrence of fever, but remained in a low anæmic state, which did not yield to tonic treatment, and a sea-voyage was recommended, during the course of which his health improved rapidly.

The severity of this attack is evident, and brings it under the head of bilious remittent fevers, although there was a complete intermission on the second day, but this must be attributed to the antipyrin. The rise of temperature on the same day, *after* the administration of thirty grains of quinine, is interesting, and is the only instance I have met with, and I believe would not have occurred had I given larger doses of quinine during the intermission. The utility of calomel was well illustrated on the fourth day, where a second dose the previous evening caused a marked amelioration of all the symptoms.

THE EFFUSION OF CHYLE AND OF CHYLE-LIKE, MILKY, FATTY, AND OILY FLUIDS INTO THE SEROUS CAVITIES.¹

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THE object of this paper is to present the subject of effusion of chyle, chyle-like and fatty fluids into the serous cavities. It will be limited to the consideration of the effusion of such fluids into the cavities of the pleuræ, peritoneum, and tunica vaginalis.

Traumatic injuries of the absorbent vessels seem to have been a subject peculiarly attractive to many of the older authors. Ruysch, as early as 1665, drew attention to wounds of the lymphatic vessels, and refers to a certain surgeon "who had, unfortunately, cut a lymphatic

¹ Read before the Association of American Physicians, Washington, September, 1889.
VOL. 98, NO. 6.—DECEMBER, 1889.

vessel in incising a venereal bubo not completely developed, from which flowed daily a great quantity of lymph." Solingen, in 1693, reported two cases of "lymph fistulæ situated at the head of the soleus muscle, one consequent upon a wound, the other produced by contortion of the limb." Muys, in 1695, saw a young man who had been wounded in the left external malleolus, and from the wound "there flowed every day a vast quantity of water." Nuck, in 1733, wrote of wounds of the lymphatic vessels. "Very often," he says, "in venesection performed on the arm, and especially when performed on the foot, the absorbent vessels are injured; by carelessness in regard to these vessels the lancet has proved fatal." Van Swieten, in 1764, recorded the observation that frequently most abundant discharges of lymph followed venesection; and Haller, a few years later (1773), stated that he had known a "flux of lymph of such long continuance, and so difficult to arrest, that he could explain its existence only upon the supposition that a large vessel" had been severed in bloodletting. Mascagni and Assalini, in 1787, cited cases of lymphorrhagia following venesection; the latter mentions the case "of a boy, eleven years old, who lost five pints of lymph in three days from a slight wound located upon the internal part of the thigh." Soemmerring (1795) and Monro also recorded observations of discharges of lymph following slight wounds; and Schreger (1799) mentions an instance of lymph fistula following bloodletting in the foot. Soemmerring remarks that the healing of wounds on the instep, near the ankles and knees, on the back of the hands, near the bend of the elbows, and near all joints, is impeded by the continual dripping of lymph, and offers the explanation that, as the "absorbents about the joints are protected only by very thin skin and very little fat," the swelling and inflammation which ensue prevent contraction and compression of the incised vessels. In 1817, Nasse recorded several instances of lymph fistulæ caused by traumatic lesions of lymph vessels; in some of the cases he analyzed the fluid discharged and proved it to be lymph.¹ Since then lymph fistulæ from traumatism seem to have attracted but little attention, though quite a large number of cases of lymphorrhœa and lymphorrhagia, occurring in consequence of diseased conditions of some portion of the lymphatic system, have been carefully recorded.

Subsequent to the discovery of the chyliferæ of the dog by Aselli; of the lymphatics in the intestines of man by Gassendi; of the receptaculum and thoracic duct by Pecquet; and of the lymphatic trunks of the extremities by Rudbeck, and about the time when the works of Ruysch, Meckel, Hewson, Mascagni, Cruikshank, and Hunter appeared, there were reported very many cases of chronic ulcers with fistulous openings, from which a fluid was discharged which the observers

¹ M. Nélaton has three times met with dilatation of lymph vessels at the fold of the elbow, on a level with the cicatrices of bleeding.

believed to be lymph. Even as late as 1859, Binet maintained that neglected lesions of lymph vessels would give rise "to ulcers of the most rebellious character," and suggests that ulcers of the lower extremities very frequently owe their origin "to alterations of the lymphatic vessels." Such ulcers may be recognized, says Binet, "by the abundance of the matter excreted, compared to the extent of the ulcer; by the increase of the excreted fluid when gentle pressure is made from the extremity toward the lesion; by the exceptional difficulty in cicatrization, and by the nature of the excretion." During the same period—previous, however, to the publication of the investigations of Mascagni, Cruikshank, Hunter, and Hewson—there were also a number of cases of "milky discharges" recorded. These were evidently cases of copious, and, perhaps, somewhat modified, purulent secretions. The instance of "milky saliva" reported by Antonio Nuck,¹ and the case of "milky discharge from the cutaneous surface of the abdomen" reported by Rommel,² are the most authentic of these curious cases. Among these dubious cases may also be enumerated the case of Schurig,³ of a milky discharge from a wound; the case of fistulous communication with cold abscesses or deep-seated suppurating glands;⁴ from the uterus, by Dolæus;⁵ from the tunica vaginalis;⁶ and from the mucous membrane of the nose, by Richter.⁷

¹ "Præcitus observed saliva evidently milky. For a woman, he says, nursing a child, again became pregnant, and therefore weaned the child. The right breast, from neglect, became like a large tumor, and on a certain night subsequently, while suffering much pain, she had an abundant discharge of milk from the mouth, with a corresponding decrease of the swelling in her breast. She swallowed the milk as it came into her mouth (without any inconvenience), which continued for four months."

"But it may be asked, how came the decrease in the breast? In my judgment in no other way than this, that the masses of the blood were laden with chyle, the particles of which could not permeate the lactiferous tubules of the mammæ on account of their collapsed condition, but formed a tumor in those nearest the mammary gland, especially since their arteries were filled and were not capable of removing any more. Indeed, the chylous and milky particles were abundantly distributed through the blood mass, and permeated the glandular structures, especially the salivary, which offered the least resistance. In the meantime, the blood, on account of its freer and quieter motion, propelled the chylous particles remaining in the breast toward the veins, and thus to the heart; hence it followed the breast was emptied." *Sialographia, etc., Ductuum Aquosorum Anat. Nova. Lugduni Batavorum, 1695, p. 49.*

² "A woman who was nursing twins began to complain, a few days after the death of one of them, of a sense of dull pain and tension beneath the ribs of the right side of the abdomen and over the umbilicus. This feeling was succeeded by stretching, the stretching by itching, and the itching by an exudation of fluid from the skin, the color, taste, and consistence of which were identical with milk, and which yielded a true butter on agitation." *Ephemerides Germaniæ, decur ii., ann. viii.*

³ *Parthenologia, Dresden or Leipsig, 1729.*

⁴ *Med. Essays and Obser., by a Society in Edinburgh, vol. 5, part 1, p. 328. 1747.*

⁵ *Ephem. Germ., decur ij., ann. vj., obs. 76.*

⁶ *Madras Quarterly Journ. Med. Sci., vol. 1, p. 180.*

⁷ *Med. and Surg. Obser., Transl. Ed., 1744.*

Assalini relates (Binet) having seen, during many months, discharged from the neighborhood of the umbilicus, in two women recently delivered, a fluid which he believed to be of lymphatic nature. Both women succumbed to puerperal accidents. When Assalini wrote (1787), the lymphatics were being studied, and it is probable that he accepted conclusions without verification, as did Soemmerring after him, who, perhaps, mistook various collections of pus for metastases of milk. Puzos,¹ whose conception of the pathology of puerperal diseases seems to have been limited to the supposed formation of depots of milk in various parts and tissues, reports several cases in which collections of milk were found in the abdominal cavity. In one instance he found a "gallon of coagulated milk," the patient having died of fever five days after delivery of a dead foetus.

The view held by Puzos, and by others previous to his time, that milk was formed from the food of pregnant women and passed commingled with the blood throughout the system, being determined, during gestation, to the uterus to nourish the foetus, and to the breast, after delivery, to nourish the infant, led very naturally to the conclusion that a superabundant supply or deficient consumption would eventuate in the formation of depots of milk in other localities.

It is probable that the cases of Bossu, Martin, and Milleret (7, 8, and 10) belong to this class of reports; nevertheless the case of "particular dropsy" first observed by Poncy in 1699, was undoubtedly a case of hydrops chylosus. The description of the morbid appearances presents so many conditions so closely analogous to those found in the case reported by Marshall Hughes in 1841 (17) that the apparent vague statements must be attributed to the imperfect knowledge of the reporter, rather than to his fancy.

Frequency.—The reported cases of effusion of chyle and milk-like fluids into the pleural and peritoneal cavities, including the doubtful cases, may not exceed sixty-three, and these reports cover a period beginning with Poncy's case in 1699 and terminating with the reports of the cases of Drs. Smith and Newcomb, of New York—one hundred and ninety years. Their infrequency relegates them to the category of pathological curiosities. Nevertheless, thirty-nine of the cases of effusion and collection of chyle and chyle-like fluids in the abdominal cavity have been observed during the present century; thirty-four of these cases since 1850, and twenty-seven during the last and present decades. The increasing frequency of occurrence is thus clearly shown. For whilst the more numerous reports during these decades may, in some measure, be due to more accurate observation and careful study of morbid anatomy, yet it is not probable that such remarkable cases would have escaped

¹ *Memoirs sur le lait ripander, on depots laitoux.* New edition, Paris, 1801. P. 141.

the observation of intelligent physicians at any period since the time of Poncy, Morton, Monro, Scherb, Percival, and Sandifort.

The increasing occurrence of the cases of effusion of milk-like and fatty fluids into serous cavities is more clearly shown by the numerous recent reports of cases of lymphocele by Manson, Lewis, and Sonsino, and in this country by Mastin, Sr. and Jr., and Guitéras. Whether or not this fact is attributable to the more extended habitation and fruitful propagation of the intermediate host of the *filaria sanguinis hominis* now known to be constantly associated with, if not the cause of lymphuria and lymphocele, is a problem of great interest and graver import.

EFFUSION INTO THE PLEURAL CAVITIES, CHYLO-THORAX.

There have been, including the doubtful cases, ten reports of cases of injury produced either by disease or accident, either of the thoracic duct or some of its larger affluent branches, in the thorax, sufficient to emit fluid in quantities incompatible with vigorous health, and certainly endangering life, if not causing death. In five of these cases, the chyle poured directly from the duct, in one of which (Bassius) the aperture in the walls of the vessel was not suspected until discovered at the autopsy. In the cases of Hoffman, Guiffart, Bonet, and Quinke the rupture of the duct was the result of external violence. The case of the learned mathematician, reported by Hoffman, was probably a case of empyema, and the case of the Baron de Heinden, reported by Bonet, who was injured by a missile in the battle of Fionensis, is doubtful, though Bartholinus, to whom the details of the case were communicated, expressed the opinion that the thoracic duct was injured. In Curling's case the lymph concretion, which occupied the right pleural cavity, was discovered in the body of a patient whose right lower extremity had been amputated at the hip-joint, ten months before his death, for malignant disease of the thigh. The concretion consisted of "softened and degenerated lymph." There was no evidence of malignant disease or "secondary deposits in any of the organs." In the cases of Rokitansky and Ormerod (see 23 and 25 of tabulated statement) chyle was found in the pleural and peritoneal cavities; in the former the effusion was the result of obstructed heart circulation, and in the latter the result of the interruption of the blood current in the left subclavian vein. In two of the cases reported by Quinke (28 and 29) chylous fluid was found in the pleural and peritoneal cavities, though the post-mortem examination determines the cases as one of "effusion of chyle into the peritoneal cavity," and the other an "effusion of chyle into the right pleural cavity." In both cases the anatomical lesions were clearly made out; in one the duct was lacerated within the thorax, and in the other, chyle retention was caused by inflammatory thickening of both folds of the mesentery. Some of the lacteals were completely, others partially occluded. The chyle vessels

were injected exactly to the union of the intestines with the mesentery. The flow of chyle was impeded, engorgement of the vessels ensued, and rupture occurred. But how explain the presence of chyle in the peritoneal cavity in Case 29 and in the pleural cavity in Case 28? In each instance the phenomenon is perhaps partially explicable upon the hypothesis that portions of the effused fluid traversed the lymph vessels of the diaphragm. In the case of Pelletier, the chylothorax and chylous ascites were associated with a milky diarrhœa and the vomiting of a milky fluid.

The cases in which fatty and oily fluids, other than chyle, have been found in the pleural cavities have not been included in this collection of cases of chylothorax. A number of such cases have been reported by Herard, Bacelli, Guéneau de Mussy, Quincke, Debove, and others. Quincke characterizes such fluids as effusions of chyle; Guéneau de Mussy as altered pus; and Debove as chyloform fluids, but specific effusions distinct from serous, purulent, or serofibrinous exudations. The clinical histories and morbid appearances associate such cases with tuberculosis and cancer, and determine the inflammatory nature of the exudate. In none of these cases has there been discovered any solution of continuity of chyle or lymph vessels.

With the exception of the cases of Rokitansky, Ormerod, and one of Quincke, all the cases of effusion of chyle into the pleural cavities belong to a class of casualties which do not admit of any generalization, and are only instructive in suggesting the occurrence of an improbable contingency, which may happen under circumstances very various.

The diagnosis of chylothorax cannot be made except by evacuation and examination of the fluid. In Quincke's case of injury by crushing of the chest wall, the effusion was not suspected until discovered by aspiration of the fluid. The prominent symptoms in such cases are dyspnœa and the accumulation of fluid in one or both cavities. In a single instance chyle was discharged drop by drop through a puncture in the chest wall. The prognosis is unfavorable and the treatment expectant.

EFFUSION OF CHYLE-LIKE OR MILKY FLUID INTO THE CAVITY OF THE TUNICA VAGINALIS TESTIS: GALACTOCELE, CHYLOUS HYDROCELE, CHYLOCELE, LYMPHOCELE, MILKY HYDROCELE, LYMPHOUS HYDROCELE, FILARIAL HYDROCELE.

The case of galactocoele reported by Vidal (de Cassis) seems to have been the first observation of this class of effusions. Ruthnum's case of hydrocele, "with contents simulating chylous urine," was published in 1864; and Ferguson's case of "milky fluid from the tunica vaginalis" in 1865. Neither of these cases attracted any special attention, and their reporters seem to have regarded them as curiosities. In Vidal's

case the fluid consisted of water, a substance resembling albumen, sugar, chloride of sodium, traces of lime, and numerous globules having the appearance of the globules of butter. In Ruthnum's the fluid looked like milk, and in Ferguson's case it consisted of a colorless fluid in which floated very many globules and a number of minute and large cells not unlike colostrum corpuscles. In each case the fluid coagulated spontaneously. Neither Ruthnum nor Ferguson refers to the case of Vidal, and probably did not know that Lebert, as early as 1855, had suggested that the case of Vidal was nothing more than the rupture of a "lymphatic varix into the cavity of the tunica vaginalis."

Previous to these reports varices had been frequently observed in the superficial and deep-seated integumentary lymphatic vessels and plexuses, but very rarely, if at all, in the capillaries and plexuses of the serous membranes. Morton, in 1689, and Mascagni, in 1787, observed varices of the pulmonary lymphatics; Caldani, in 1761, described a varix of the lymph vessels of the heart; Wathen, in 1787, and Sandifort, in 1780, recorded cases of dilatation of the lymph vessels of the small intestine. In the latter case the varix resulted from obstruction of the lacteals, caused by intussusception. Soemmerring observed the dilatation of the lymphatics of the duodenum and of the intestines in herniæ. He also refers to instances in which he had seen the lymphatic vessels of the liver and spleen "filled with a whitish material," and Lebert asserts that he had frequently observed dilated lymphatics on the surfaces of the liver and lungs. Schreger and Tilesius saw a case of dilatation of the lymph vessels of the conjunctivæ.

The fourth case in chronological order was reported by C. H. Mastin (1874), of Mobile, and to him is due the credit of verifying the suggestions of Lebert. After an examination of a specimen of the fluid obtained at the first tapping, I called the attention of Dr. Mastin to this suggestion, and in his second operation in April, 1875, he "opened the sac freely for a distance of two or three inches" and discovered, at the upper portion of the membrane, where it begins to be reflected over the testis, "a granular-looking mass," which having been snipped off was recognized by him to be the "patulous mouths of three or four small vessels," which he believed were "portions of lymph vessels." In 1881, in a similar case, Dr. W. M. Mastin practised the same procedure and discovered a varix similarly located, but when cut off showed the patulous orifice of only a single vessel, from which lymph exuded. Specimens of fluid from both of these cases were carefully examined by Dr. James Tyson, who described them as comparable to chyle in their chemical and physical characters, and expressed the belief that they found exit into the sac through rupture of a lymph vessel.

These two observations made by our own countrymen, in the city of Mobile, seemed to have established the nature of lymphocele. But, in

the meantime, Lewis had discovered the *filaria sanguinis hominis*, and quite a number of cases of lymphocele, lymphuria, and elephantoid diseases had been reported by Manson, Lewis, Sonsino, and others, in which this parasite was recognized as the probable, if not the constant and positive cause. In this country, since the beginning of 1885, there have been reported thirteen cases in which the *filaria* were found, two of which were cases of lymphocele. The first in 1886 by Guitéras, in the city of Charleston, and the other in 1888 by Mastin, in the city of Mobile. Manson ascribes elephantoid diseases to embolism of lymphatic glands by the ova of the *filaria*, stasis, and consequent regurgitation of lymph. If this be true, it is not improbable that the varicose and ruptured lymph vessels of the tunica vaginalis in cases of lymphocele are the result of gland obstruction produced by similar emboli. It has not been shown, however, that *filaria* are present in every case of lymphocele. It is conceivable that adenitis, gonorrhœal lymphangitis, or other conditions which obliterate the permeability of neighboring and connecting glands might cause stasis of lymph and dilatation and rupture of lymph capillaries and plexuses, with which the serous membranes are so richly supplied. Vidal vaguely hinted that a previous gonorrhœa was the cause in his case; and Mastin, in a review of the previous cases, assumed, in 1883, that chylocele was due to "obstructed gonorrhœal lymphangitis." Since the discovery of the *filaria* in the third case occurring in Mobile, he has modified his opinion, and hints at a classification of causes into filarial and inflammatory obstruction of lymph-glands. Sonsino asserts that the theory of mechanical obstruction caused by the adult worm in the lymphatic channels, with all its consequences, as lymphangitis, lymphatic dilatations, rupture, and consequent lymph extravasation or external lymphorrhagia "is sufficient to explain all the morbid disorders or diseases which have been associated with the worm, and may be originated by it, as lymphuria and lymphocele." The matured opinion of those who have had the best opportunities of studying the relation of the *filaria* to diseases in general seems to accept the statement of Sir Joseph Fayrer that "it has been shown that disorders of the lymphatic system are most frequently associated with, if not caused by, the *filaria*." Guitéras asserts that "manifestations of filarial disease may all be included under the head of disturbances of the lymphatic circulation." This view meets with opposition from Rake, who failed to find *filaria* in cases of elephantiasis and chyluria examined by him in Trinidad.

The chemical and physical properties of the fluid emitted in lymphocele characterize it as a pathological product. Simple dilatation and rupture of a lymph channel, plexus, or space would not necessarily give exit to a fluid so rich in fat and other products.

The recent invasion of portions of the sub-tropical belt of this country

by the filaria, and reports of cases of disease with which the parasite has been so uniformly associated, together with the fact that the mosquito has been proven to be its intermediate host, present considerations of the highest importance to the profession and general public.

The diagnosis of lymphocele depends upon the ordinary symptoms of hydrocele and opacity of the tumor, but the character of the fluid can only be ascertained by observation and chemical and microscopical examination. Vidal noted the absence of translucency. It may be that the general symptomatology of filarial disease coexisting with the collection of fluid in the tunica vaginalis might suffice to determine the presence of parasitic lymphocele, but neither of the cases observed in Mobile seems to have presented such a clinical picture and history. The case cited by Guitéras was associated with commencing elephantiasis of the scrotum.

Ruthnum cured his case by injections of iodine. Mastin dissected back the varix for a short distance and "tied the bundle *en masse*, with a small and very strong silk ligature." Mastin, Jr., practised the same procedure. In both cases the cure was complete.

CHYLOUS, CHYLIFORM, AND OILY ASCITES. [HYDROPS CHYLOSUS: HYDROPS ADIPOSUS.]

The accompanying tabulated statement, arranged chronologically, presents a brief and condensed summary of the reports of the cases of chylous and oily ascites. A rigid analysis would exclude many from the category of chylous ascites. The cases of Bossu, Martin, Milleret, and Sandifort, which occurred in puerperal women, are so closely allied to the views of Puzos, previously referred to, that they must be accepted *cum grano salis*. In two of the cases there was no extravasation into the peritoneal cavity, one of which was a chylous cyst of the mesentery, and the other a case of chyle retention in the chyle vessels of the mesentery. In several of the cases (18, 19, 21, 27, and 34) the fluid was more oily than chylous and coexisted with tuberculous peritonitis, which would more properly characterize the fluid as a morbid exudation than an effusion of chyle. In three of these five cases the ascites was ascribed to obstructed pulmonary circulation, one of which (18) had suffered for a long time with chronic bronchitis, with "purulent expectoration containing tuberculous concretions;" another (27) suffered for several years with scrofulous affections and died of pulmonary tuberculosis; and the third (21) died of pulmonary and peritoneal tuberculosis. Excluding the puerperal and tuberculous cases, together with the two in which no extravasation was found in the peritoneal cavity (50 and 53), the cases of chylous ascites proper will not exceed twenty-eight. In Case 37, Prof. Winiwarter ascribed the intra-abdominal effusion to "congenital occlusion of the thoracic duct, formation of a compound cystic tumor through

CASES OF CHYLOUS CHYLIFORM AND OILY ASCITES ARRANGED CHRONOLOGICALLY.

No	Reporter.	Date.	Where reported.	Sex.	Age.	Causative conditions.	Treatment.	Results.
1	Poncey, Jr. ¹	1699	Saviard, <i>Observations in Surgery</i> , trans. by Surgeon, p. 247. Lond.	F.	18	Obstruction of lymph glands and vessels.	Medicines and tapping.	Died.
2	R. Morton. ²	1705	Morton's <i>Phthisiologia</i> , Lib. I., chap. x.	M.	2	Compression of duct, near subclavian vein, by large tumors behind "trachea arteria," producing rupture of lacteals.	Tapping.	Died.
3	Littre,	1710	Mém. de l'Acad. des Sci.	F.	7	Enlarged and chalky mesenteric glands.	Not stated.	Died.
4	Chomel,	1728	Mém. de l'Acad. des Sci.	F.	24	Rupture at umbilicus third day after confinement, with discharge of five pints of milky fluid; supposed rupture of abdominal lymphatics.	Counter-opening.	Recovered.
5	J. G. Scherb,	1729	Haller, <i>Disertatio Abmorborum</i> , vol. iii. p. 237.	M.	39	Calculus in receptaculum chyli.	Tapping.	Died.
6	Donald Monro. ²	1765	Essay on Dropsy.	F.	...	Effort to "raise a burthen."	Tapping.	Died.
7	Bossu,	1770	Journ. de Méd. Chir. Pharm., xxxiv. p. 283.	F.	...	Metastasis of mammary secretion during first week of puerperium.	Tapping, purgatives, and resolvent applications to abdomen.	Recovered.
8	Martin,	1770	Journ. de Méd. Chir. Pharm., xxx. p. 555.	F.	...	Mérorrhagia; miscarriage; unusual exercise.	Tapping.	Recovered.
9	Targioni, cited by Bianchi. ³	1771	Lo Sperimentale, lvii. p. 78, 1886.	F.	21	Obstinate chlorosis; imperfect chyliification due to pressure of lymphatics by enlarged spleen.	Tapping, purgatives, deobstruents, corroborants, diuretics, cardiac tonics, mercury.	Recovered.
10	Milleret,	1774	Journ. de Méd. Chir. Pharm., xlii. p. 257.	F.	39	Arrest of secretion from mammary glands and intestinal canal.	Spontaneous discharge at umbilicus, and tonics.	Recovered.
11	Joseph Lieutard,	1779	Historia Anatomica Medica, t. i. p. 257.	...	7	Mesentery cirrhotosed and filled with a whitish, chalky substance; large quantity of milky or chylous fluid in abdominal cavity.	Not stated.	Died.
12	Lossium, cited by Lieutard.	1779	Historia Anatomica Medica, t. i. p. 257.	...	Child	"Abdominal cavity filled with a milky fluid, evidently derived from ruptured chyliferous vessels."	Not stated.	Died.
13	Ed. Sandifort,	1781	Observ. Anat. Patholog., Ludg. Bat., iv. 1-21, 3 pl.	F.	...	Following premature birth of twins at seven months. Sandifort reports another case of lacteal metastasis to abdominal cavity.	Effusion only discovered at autopsy.	Died.
14	Percival, ²	1788	Essays, Med., Physiol., and Exp., ii. p. 177.	F.	8	Rupture of lacteals.	Tapping.	Recovered.
15	Weaver,	1814	Med., Surg., and Pharm. Repos., ii. p. 377.	M.	...	Protracted illness, supposed to be liver disease,	Mercurials and other medicines.	Died.
16	Truman Abell,	1833	Boston Medical and Surgical Journal, vii. p. 13.	F.	...	Abdominal tumor following pregnancy with twins.	Spontaneous rupture at umbilicus with discharge.	Died.

¹ First tapped by Poncey July 2, 1699. Died in 1670, after twenty-second tapping; amount of fluid withdrawn 285 French pints.² Essay on Dropsy and its Species, by Monro, third ed., p. 22. London, 1765.³ Bianchi cites three cases from Méhu, but without details; probably cases of chyliform ascites.

No.	Reporter.	Date.	Where reported.	Sex.	Age.	Causative conditions.	Treatment	Results.
17	Hughes,	1841	Guy's Hospital Reports, v. p. 297.	M.	30	Tumor of agglomerated mesenteric glands; numerous lacteals were large, tortuous, varicose, and distended with milky or clear fluid.	Not stated.	Died.
18	Van Camp,	1843	Ann. Soc. de Méd. de Anvers, ii. p. 86.	M.	59	Chronic bronchitis, asthma, tuberculosis.	Not stated.	Died.
19	J. Popham,	1854	Dublin Quarterly Journal of Medicine, xvii. p. 467.	F.	28	Chronic peritonitis, with fat in the effusion; fatty degeneration of liver; free fat in blood; fatty contents of both ovaries combined with hair and bony matter. Symptoms analogous to those of tubercular peritonitis; numerous tubercles in lungs.	Not stated.	Died.
20	M. Lornain,	1859	Compt. Rend. Soc. de Biol., Par 2, s. v. 162.	F.	8	Report refers only to the composition of two specimens of milky fluid obtained from abdomen in two cases.	Not stated.	Died.
21	T. Stevenson,	1860	Guy's Hospital Reports, 3 s., xvii. p. 231.	F.	42	Mitral and tricuspid insufficiency; thoracic duct plugged at outlet with pale and red fibrous coagula; walls thickened; lumen dilated with thrombi.	Not stated.	Died.
22	Oppolzer,	1861	Allg. Wien. med. Zeitung, S. 149.	F.	6	Dilatation of heart; thickening and shortening of mitral valve; occlusion of thoracic duct with soapy material.	Not stated.	Died.
23	Rokitsansky,	1861	Patholog. Anatomy, Bd. II. S. 388.	F.	19	Fibrous vegetations attached to intima of subclavian vein; partial obliteration of thoracic duct near its outlet; rupture of receptaculum.	Not stated.	Died.
24	W. Cayley,	1866	Trans. Path. Soc. Lond., xvii. p. 163.	M.	24	Left subclavian and its affluent branches plugged with a light colored and ragged clot.	Tapping.	Died.
25	Ormerod,	1868	Trans. Path. Soc. Lond., xix. p. 199.	M.	...	Rupture of chyle vessels from pressure of a tumor.	Not stated.	Died.
26	Hoppe-Seyler,	1873	Arch. Gesamte Phys., vii. p. 407.	F.	27	Scrofula; pulmonary tubercle; oily ascites.	Not stated.	Died.
27	Bergeret,	1875	Journ. d'Anatomie, t. ix. p. 585.	F.	30	Flow of chyle obstructed by inflammatory thickening of folds of mesentery and transformation of adipose into connective tissue.	Tapping.	Died.
28	Quincke,	1875	Archiv f. klin. Med., Bd. xvi. S. 128.	M.	50	Run over by a wagon. Rupture of thoracic duct; effusion into peritoneal and pleural cavities.	Tapping.	Died.
29	Quincke,	1875	Archiv f. klin. Med., Bd. xvi. S. 121.	F.	33	Primary cancer of peritoneum; fluid containing fat globules and fat cells; hydrocus adiposus.	Not stated.	Died.
30	Quincke,	1875	Archiv f. klin. Med., Bd. xvi. S. 121.	F.	10	Scrofulous glands, and tuberculous; fluid milky and fatty; hydrocus adiposus.	Not stated.	Died.
31	Quincke,	1875	Archiv f. klin. Med., Bd. xvi. S. 121.	F.	12	Scrofula and milary tubercle; milky fluid, with fat and fatty cells; hydrocus adiposus	Not stated.	Died.
32	Friedreich, cited by Quincke,	1875	Archiv f. klin. Med., Bd. xvi. S. 121.	F.	...	Chylous fluid vomited; also found in peritoneal and pleural cavities.	Tapping.	Recovered.
33	Pelletier,	1875	Journ. de Méd. Chir. Pharm., lxxiii. p. 496.	F.	2 mos.	Abdominal tumor firmly attached to spinal column in umbilical region; rupture of thoracic duct.	Tapping, first at two months.	Died.
34	Wilhelm,	1875	Corres.-Blat. d. Aertztlichen Vereine d. Rhein prov., No. 14, p. 13.	F.	39	Peritoneum closely studded with tubercle.	Tapping.	Died.
35	Ballman,	1876	Centralbl. f. d. med. Wissensch., xiv., p. 274.	F.				

No.	Reporter.	Date.	Where reported.	Sex.	Age.	Causative conditions.	Treatment.	Results.
36	F. Winckel,	1876	Archiv f. klin. Med., Bd. xvii. S 303.	F.	39	Puncture of chyle vessels by parasites. Had lived in Surinam.	Tapping; lived four years.	
37	Winliwarter,	1877	Jahrbuch. f. d. Kinderheilkunde, v. xi. Nos. 1, 2, and 3.	F.	Birth	Rupture of chylous cyst; probable occlusion of thoracic duct and dilatation of lacteals.	Careful alimentation and tapping.	
38	Kein,	1881-2	Mém. Soc. de Méd. de Strassburg, xix. 2, 52, 57.	F.	50	Rupture of mesenteric and intestinal lacteals.	Tapping, each time four gallons of milky fluid.	
39	Smidt, with permission of Guttman, Veil,	1881-2	Zeitschrift f. klin. Med., p. 199	M.	11	Chronic idiopathic peritonitis.	Tapping.	Died.
40		1882	Paris Thèse, 21.	F.	25	Syphilitic gummata of liver; fluid chylous and rich in fat globules with few leucocytes.	Not stated.	Died.
41	Gaucher, cited by Veil,	1882	Paris Thèse, 21.	M.	47	Cirrhosis of liver; milky and containing fat.	Not stated.	Died.
42	Gaucher, cited by Veil,	1882	Paris Thèse, 21.	M.	39	Hard drinker; cirrhosis of liver; fluid first two tappings ordinary, afterward milky and fatty.	Not stated.	Died.
43	Gaucher, cited by Veil,	1882	Paris Thèse, 21.	...	11	Sarcoma of omentum and mesentery; enlarged and degenerated mesenteric glands. Thoracic duct normal.	Not stated.	Died.
44	Whitla,	1883	Brit. Med. Journ., vol. i. p. 1085, 1885.	M.	13	Peritoneum and pleuræ studded with miliary tubercle; liver and lungs infiltrated with miliary granulations; mesenteric gland enlarged, forming tumor; thoracic duct occluded at middle third, dilated at lower third, with perforation at lowest part; receptaculum dilated and perforated.	Tapping; 117½ pints withdrawn in three months.	Died.
45	F. Nickerson,	1884	Mass. Med. Soc., June, 1884.	M.	56	Chylous cyst; probably continuous hard labor.	Tapping.	Recovered.
46	Lettnle,	1884	Revue de Méd., iv. p. 723.	M.	3 mos.	Congenital cardiopathy and chronic peritonitis, with cough; probably syphilitis.	Tapping and digitalis.	Improved.
47	Lettnle,	1885	Revue de Méd., iv. p. 90.	M.	8	Rheumatism involving heart; enlarged liver and spleen; fluid milky, containing granules, leucocytes, and fat globules.	Not stated.	Died.
48	Strauss,	1886	Arch. de Physiolog. et Patholog.	M.	61	Peritoneal cancer, perforation of chyle vessels on anterior surface of mesentery.	Tapping; diet of milk and butter.	Died.
49	P. J. Murphy,	1886	Pamphlet.	F.	19	Violence; long and fatiguing walks and dancing.	Laparotomy.	Recovered.
50	N. B. Carson,	1889	Medical News, iv. p. 52.	M.	39	Chylous cyst of mesentery.	Laparotomy and removal of cyst.	Recovered.
51	Stephen Smith,	1889	Personal communication.	M.	9	General health fair; no cause discovered, 28 pints of fluid evacuated in 21 days; rich in lymph cells, few blood corpuscles, slightly acid; specific gravity 1015.	Tapping and drainage tube.	Under observation.
52	J. E. Newcomb,	1889	Personal communication.	M.	2	Previous health good; no cause discovered; fluid milky, containing lymph cells.	Tapping.	Under observation.
53	Weichselbaum, ¹	....	Virch. Archiv, lxi. p. 145.	M.	89	No extravasation, but stasis of chyle in the chyle vessels of the mesentery and hypertrophy of the interposed adipose tissue.	Discovered at autopsy.	Died.

¹ Case of chylangioma cavernosum.

distention of the lacteals at the root of the mesentery by obstructed chyle, rupture of one of the cysts before or during birth, persistency of this solution of continuity, and increasing effusion of chyle." In twenty-seven cases the rupture of some chyle-conveying vessels seems to be clearly established.

Etiology.—Age is an unimportant element of causation. The ages of the twenty-eight cases vary between birth and sixty-two years. Fifteen were females, the oldest sixty-two and the youngest at birth. The ages of the eleven males ranged between two and sixty-one years. If the puerperal and tubercular cases be included, sex assumes a more important etiological relation, and the proportion would be two females to one male. Race, climate, occupation, and circumstances of life are without influence. Hereditary and acquired tendency to diseases of the lymphatic system, and especially disease of the walls of the thoracic duct and receptaculum chyli, which are very rare and mainly limited to tuberculous infiltrations and ossific changes, demand mention as primary conditions which may facilitate the rupture of the walls of chyle-conveying vessels; syphilis may also. Primary rupture occurred in but five of the cases. In one (6) the cause was "an effort to raise a burthen;" in two (45 and 49) muscular effort; one vomiting; and one violence inflicted upon the chest. In eleven cases the rupture or perforation was demonstrated, and in sixteen others the character of the fluid left no doubt of its escape from a chyle-conveying vessel.

Chylous ascites may be the secondary result of a variety of morbid conditions which directly or remotely obstruct the flow of the chyle through the lacteals, receptaculum, or thoracic duct, impede its exit into the left subclavian vein, or retard the current of blood in the left subclavian vein, right side of the heart, or lesser circulation. Such obstruction may be caused by anatomical defects and anomalies of position and distribution of the chyle vessels, by dilatation or stenosis, and such disease of the coats of these channels as would lessen their expansibility and tensile strength; by disease of the mesentery, hypertrophy, cavernous and fibroid transformation of its adipose tissue; by indurated, degenerated, and impermeable mesenteric glands, embolism, and deposits of bony, chalky, gelatinous, and soapy material in the channels; compression by inflammatory adhesion or by thoracic, abdominal, and aneurismal tumors. In one case it was ascribed to the presence of the filaria.

Dilated chyliferous lymphatics are quite often observed in the mesentery. The usual cause (Zeigler) is obstruction due to inflammatory or neoplastic growths located in the mesentery or thoracic duct. Sometimes the obstruction is due to lymph thrombosis. The dilated vessels look like straight cylindrical ridges, or convoluted, saccular, or beaded cords; their contents are either white and limpid or pulpy and caseous.

In three cases (5, 24, and 43) the aperture through which the chyle escaped was found in the wall of the receptaculum; in one the perforation resulted from ossification of its wall and filling of the cavity with a bony concretion; and in No. 24, in consequence of stenosis of the thoracic duct, near its outlet. In five cases (1, 2, 14, 17, and 28), and probably in 23 and 26, the rupture took place in the lacteals. In four of these cases, and in the cases of Hoppe-Seyler, Abell, and Wilhelm (16, 26, and 34)—in which no post-mortem examination was made, abdominal tumors were discovered, either by inspection of the cadaver or by palpation during life. In two cases the thoracic duct was compressed by tumors located near its entrance into the left subclavian vein. These tumors were usually glandular, and consisted of hypertrophied and degenerated bronchial or mesenteric glands coexisting, in two instances, with cancerous formations.

In Cases 23 and 25, the chylous effusion into the peritoneal cavity was attributed to interrupted venous blood current in the subclavian and innominate veins; and in Cases 2, 17, and 24 to stenosis of the thoracic duct at or near its entrance into the left subclavian vein. Clinical observations seem to have established the causal relation of interrupted blood current in the large veins near the heart to lymph stasis and effusion of chyle into the peritoneal cavity, and the experiments of Cooper, Morton, Dupuytren, and others demonstrate that complete arrest or interruption of the current of the fluid in the thoracic duct, at or near its terminal extremity, will, if the anastomotic circulation is not speedily and sufficiently established, produce distention, dilatation, and repletion sufficient to cause rupture, which most frequently takes place in the receptaculum or lacteals. Clinical and post-mortem observations are even more conclusive than experimentation, for they connect directly the process of gradual occlusion of the duct by disease with the concurrent development of a diffuse area of lymphangiectasia, which in some cases terminated in rupture and extravasation. In this connection may be cited the cases of Rokitsansky, Ormerod, Morton, Hughes, and Cayley enumerated in the tabulated statement, and other cases which I have collated in a contribution to the *AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, vol. xc. p. 373.

The force exerted upon the contents of the thoracic duct by the passing current of blood in the subclavian vein is nothing more than an illustration of the hydraulic principle of Venturi, but the explanation of the relation of cause and effect between cardiac disturbances and lymph stasis and chyle effusion must, in a general way, be sought in the varying conditions of blood pressure. Niemeyer² asserts that "obstructive

¹ Busey: The Causal Relation of Obstructed Cardiac Circulation to Lymph Stasis. *AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, vol. xc. p. 373.

² Text-book of Practical Medicine, vol. i. p. 120.

engorgement of the great veins extends to the thoracic duct," and Hertz says an over-distended left subclavian vein will not permit the adequate emptying of the thoracic duct.¹

The relation of the puerperal conditions to the effusion of chyle are not susceptible of explanation. The theory of metastasis of the secretion of the mammary glands is untenable. In Sandifort's case the uterus and vagina were lined by a pseudo-membrane, which was not detachable; in Martin's case the evacuated fluid resembled whey; in Milleret's case the fluid was at first white, "of the consistency of clear bouillon," afterward gelatinous and offensive, and, finally, soap-like and odorless. Subsequently the patient suffered with lymphatic engorgement of the lower extremities and lumbar region, but finally regained her health. In the case reported by Bossu the secretion of milk was so abundant that applications were made to suppress it, which were entirely successful; then followed the accumulation of milky fluid in the abdomen, which having been evacuated, "the milk returned to the breast," and no reaccumulation followed. Three of these four patients recovered. The occurrence of lymphatic œdema in Case 10 is the only circumstance in the clinical reports of these cases suggestive of such a diagnosis, but it is insufficient to justify the classification of the case in the category of chylous ascites. The case reported by Chomel is analogous to the case of Truman Abell, and is worthy of a more favorable consideration. "A puerperal woman, aged twenty-four years, after suffering for several days with a swelled, tender, and painful abdomen, was suddenly awakened during the night by the pouring out of a milky fluid through a rupture of the umbilicus. Five pints of fluid were lost." Chomel ascribed the accumulation of fluid in the abdominal cavity to rupture of lymphatic vessels.

Pelletier's patient (33) was seized with chylous vomiting and diarrhœa, and a chylous fluid was withdrawn by tapping from the pleural and peritoneal cavities. This case was reported in 1875, at a period when a mistake in diagnosis ought not to have been made; nevertheless, the causal relation of the vomiting and diarrhœa to the extravasation of a similar fluid into the serous cavities is not apparent. Sprague reports a "fatal case of vomiting of a chyle-like fluid," but there was no effusion into either of the serous cavities. Chyle may be vomited and discharged *per anum*, and it is not impossible that in rare instances the effort at vomiting might rupture some chyle-conveying vessel.

In nine cases the fluid found in the peritoneal cavity was associated with tuberculosis, in four of which it is distinctly stated that the peritoneum was more or less studded with tubercle. The fluid in these cases was very rich in fat, albumen, and chlorides. Perforation or rupture of a chyle-conveying vessel was discovered in two of the cases.

They were reported as cases of milky or oily ascites, and their clinical histories picture the ordinary symptomatology of either pulmonary or peritoneal tuberculosis.

In some of the cases of chyliform ascites, in which no solution of continuity of chyle and lymph channels could be discovered, the fluid consisted of an inflammatory product mixed with lymph and chyle. In such cases the chyle and lymph must have escaped by transudation. This conclusion is the more probable in view of the facts that in some of these cases the changed condition of the coats of the vessels was such, together with the partial or complete obliteration of the lumen of the thoracic duct or smaller channels, either by the thickening of their walls or by the lodgement of morbid products, that transudation of lymph and chyle might take place in quantities sufficient to impart to the coexisting inflammatory product characteristics easily distinguished by the ordinary methods of physical, chemical, and microscopical examinations.

In another form of chyliform ascites, as for instance the cases of Whitla and Straus, in which the fluid was not unlike that found in the cases above referred to, but containing a larger proportion of chyle and lymph, the admixture of chyle and an inflammatory product was clearly demonstrated by the coexistence of tuberculous peritonitis or cancer, and the discovery of one or more perforations in the walls of the chyle or lymph vessels, through which chyle and lymph escaped. In several of such cases there was also discovered more or less obstruction to the flow of chyle through the thoracic duct, and, consequently, increased pressure in the receptaculum, lacteals, and lower part of the duct, where rupture almost always take place.

In that form of chyliform ascites more properly and usually denominated adipose or oily ascites, in which the lymph and chyle channels, lymph-glands, lacteals, and mesentery are intact and free from disease, distention, pressure, or obstruction, and normal in structure, size, and position, which must exclude the effusion of lymph or chyle by transudation or escape through solution of continuity in any part of the lymph system, the milky, fatty, chyle-like, and opalescent fluid must necessarily be a morbid product. The fluid in this class of cases varies somewhat in appearance, but more markedly in the proportions of fatty matter. Guéneau de Mussy asserts that all such cases are simply cases of chronic tuberculous, cancerous, or neo-membranous peritonitis, which is probably true, with, perhaps, a single exception. That exception refers to the case of Guttman, reported by Smidt, in which the cause is ascribed to a "chronic idiopathic peritonitis."

Whilst, therefore, in most cases of chylous and in some cases of chyliform ascites, there is either rupture or perforation of a chyle-conveying channel, transudation through attenuated, diseased, and degenerated walls cannot be excluded as a cause. In the chyliform varieties transu-

dation is the most frequent and important element of causation, because of the more constant presence of morbid conditions of the walls of such channels.

It must, then, be admitted that these forms of ascites are more frequently due to some lesion of the lymphatics than to any other cause. Nevertheless it is true that ascitic fluid may be milky or chylous in appearance without containing any chyle or lymph. Letulle and Guéneau de Mussy believe that the lactescent color of such fluids is due to the fatty degeneration of the white blood-corpuscles.

Symptomatology and Diagnosis.—The symptomatology of effusion of chyle into the peritoneal cavity is not sufficiently distinctive to differentiate such cases from those of ordinary ascites. Wounds of chyle-conveying channels might be diagnosticated by the location and direction of a stab or puncture, in connection with the escape of chyle into the pleural or peritoneal cavities or externally through the aperture, or its evacuation. As such effusion can only occur through transudation or solution of continuity, its escape externally, or presence in either cavity, must be essential for differential diagnosis. If no fluid escapes externally, then only the symptoms of a fluid accumulation in the cavity are present, the character of which must be ascertained by evacuation and examination.

The quantity of chyle which may escape by transudation through the walls of normal vessels is small, and the accumulation is neither rapid nor continuous. When it escapes through an aperture in the walls of some channel the opposite conditions are present. Hence an effusion of chyle might be suspected when a rapid accumulation of fluid in the peritoneal cavity should be associated with sudden loss of appetite, acute emaciation and anæmia, rapid prostration, diminished secretion of urine, and the presence of such conditions as would suggest occlusion, stenosis, or compression of the thoracic duct, or arrest of the exit of the chyle into the subclavian vein. The gradual, partial, and progressive compression of the thoracic duct has been frequently determined by the location of a tumor, associated with evidence of blood impoverishment. In uncomplicated cases due to rupture (Cases 6, 48, 49), "the patient, usually after exertion (Murphy), is suddenly seized with sharp, localized pain, followed by swelling of the abdomen," anuria, anorexia, nausea, and, possibly, vomiting. In most cases the symptoms are complicated with those of the causative condition, and a diagnosis is only possible by an examination of the evacuated fluid. In no instance has a diagnosis been made previous to observation of the fluid.

In the chyliform varieties the symptomatology is even more variable, because of the presence of the symptoms of the concomitant visceral lesion.

In some cases of suspected leakage of chyle the diagnosis may be verified by experimental feeding. In Poncy's case the odor of some articles of diet was recognized in the evacuated fluid; and in the case reported by Straus the proportion of fat in the fluid more than doubled during the exclusive milk and butter diet.

Prognosis.—Of the 53 tabulated cases, 33 died, 10 recovered, and in 7 cases the result is not stated. 3 of the puerperal cases recovered, and all the tubercular cases died. Of the 10 recoveries, 8 were females and 2 were males. Of the 28 cases of chylous ascites proper, 15 died, 6 recovered, and in 5 cases the result is not stated. Of the 5 recoveries, 4 were females and 2 males. In whatever aspect the cases may be considered, the prognosis is unfavorable. The larger number of cases were females, and the larger proportion of recoveries were of the same sex. The female sex, therefore, exhibits greater liability to, and a greater probability of recovery from, chylous ascites than the male. In view, however, of the nature of the causative lesions—perforation or rupture of a chyle-conveying channel—the proportion of recoveries is remarkable.

Bianchi says the prognosis is more grave when the extravasation is due to some chronic lesion of the chyliiferous vessels than when it is due to a rupture of the thoracic duct, for the escape of lymph favors the union of the edges of the wound and the closure of the latter by thrombi. It is even more grave when the rupture of the vessel is due to abnormal distention caused by some obstacle because the process of healing is interfered with. The gravity of the prognosis is increased when there are concomitant visceral lesions. The immediate prognosis is perhaps more grave in chylous ascites than in the chyliiform. The more extensive the lesion of chyliiferous vessels, and the larger the wounded or diseased vessel, the greater the facility of the reproduction of the ascites, and the more rapid and progressive the emaciation.

There is no instance of the preservation of the life of an animal beyond a limited number of days, in which the communication of the lymphatic with the venous system had been completely and permanently obliterated. The wound inflicted by ligation of the thoracic duct could not have caused the death of the animal experimented upon, for in a number of cases it healed by the first intention; neither could death be attributed to the rupture, either of the thoracic duct, lacteals, or receptaculum, nor to the extravasation of chyle or lymph into the pleural or peritoneal cavities, or into the cellular tissue about the abdominal viscera, for death took place in those cases in which neither of these conditions complicated the ligation of the duct, as it did in those in which one or more of these conditions supervened. When the animals, in cases of experimental ligation of the duct, recovered, the current of chyle and lymph was reëstablished through anastomosis. Monro inflicted a wound in the receptaculum chyli of a pig, from which it apparently recovered, but effusion was

arrested by a coagulum. Lower ruptured the thoracic duct of a dog; the animal died after languishing a few days, and two pounds of chyle were found in the right pleural cavity. Bartholini mentions a case in which the thoracic duct was wounded, and the patient lived a long time—"longa fuit tabes." Goodlad refers to the case of a man who was wounded in the duct, who seemed nearly cured, but finally died.

The clinical and post-mortem cases, in which the communication between the venous and lymphatic systems was either partially obstructed or wholly obliterated, are not very numerous; and many of the reports are simple statements of bare facts, wanting in the particulars necessary to demonstrate the effect of obstructed conditions of the duct and lacteals upon the duration of life. Meagre and unsatisfactory as these clinical details are, they, nevertheless, point to two conclusions: 1st, that a free and unobstructed channel of communication between the venous system and chyle-conveying vessels is essential to the proper nutrition of the body and preservation of life; and 2d, that death following the partial or complete obliteration of this communication is the result of inanition. The gradual wasting of the body and progressive debility which so markedly characterize the clinical cases in which the flow of chyle, either through the duct or anastomosing connections, was insufficient for the maintenance of the normal standard of nutrition, more decisively point to innutrition as the cause of death than the sudden exhaustion which follows the abrupt arrest of the flow of chyle and lymph toward the blood. In the experimental and traumatic cases there may be the superadded element of violence, but this cannot be a potential influence, for it has been proven that in every instance of experimental obliteration of the communication in which death occurred, no anastomosing connection could be discovered, and in every case in which life was preserved, where proper methods were adopted to eliminate all doubt, such anastomosing connections were found. The causative condition must, undoubtedly, influence the duration of life, but without the loss of chyle it would, as, for instance, in cases of compression of the channel by a benign tumor, not be very significant.

Clinical reports furnish many cases which illustrate the direct relation, as cause and effect, which subsists between copious losses of lymph and chyle and the marked depression, dulness, and exhaustion which invariably succeed abundant lymphorrhagiæ; and which, likewise, follow artificial occlusion of the thoracic duct, and so distinctly characterize the brief after-life of the animal thus permanently deprived of nutritive material. With but rare exceptions, the cases of copious loss of lymph have been attended with great exhaustion. The latter class may by rest, arrest of the lymphorrhagiæ, and proper alimentation recuperate, to suffer again and, perhaps, many recurrences, similar in course, duration, and effect; but copious and continuous loss of chyle is inevitably fatal.

Cooper records the observation that young dogs experimented on by

him lived longer than the old, and the lean much longer than the fat. In the clinical cases the average age of the fatal cases was thirty-one years, and in those who recovered it was twenty-four years, but the cases are too few, in which the ages are given, to attach any value, as an element of prognosis, to a difference of seven years.

It is not possible to establish any constant and direct relation between the appetite and the obliteration, perforation, or rupture of the chyle-conveying channels. It lacks uniformity—sometimes diminished, sometimes variable, and again voracious, even in the same patient, but is uniformly associated with progressive emaciation, quite often with fever of the hectic type, and gastro-intestinal disorder with white and chalky stools. In the case of chylous ascites reported by Poncy, from July 16, 1699, to March 4, 1700, the date of his death, 289 French pints of fluid had been drawn in twenty-twoappings. The evacuated fluid was always chylous, and frequently emitted the odor of articles of diet. In this patient there were progressive emaciation and waste of all the tissues of the body.

NATURE OF THE EFFUSED FLUID.

In most of the cases of effusion into the pleural and peritoneal cavities the fluid was chyle, which had escaped from chyle-conveying channels. In the cases of lymphocele, it was altered lymph, consequent upon pathological processes affecting primarily the lymph vascular system. In the cases of milk-like, fatty, and oily fluid found in the peritoneal cavity the character of the fluid was the result of coexisting degenerative processes. Quinke, Friedreich, and Klebs have reported cases of adipose or fatty dropsy connected with peritoneal and mesenteric cancer. In some of the cases, especially so in the puerperal, the naked-eye observation of the milky appearance of the fluid was the only circumstance upon which its chylous nature was based. In several of the tubercular cases the analysis established its fatty and oily character, but did not prove it to be chyle. Bergeret's case of oily ascites was associated with suppurating glands; in Hughes's case "cerebriform cancer" was present; and in one of Quinke's cases a cancerous nodule developed in the subcutaneous tissue at the point where the puncture was made to evacuate the fluid. In several of the cases abdominal tumors were found, but their nature was not determined.

The fluid in lymphocele is lymph, in rare instances but slightly altered, containing more water and less corpuscular element, but usually, and especially in the parasitic variety, so changed as to be comparable to chyle. It varies in color from that of ordinary lymph to a canary-yellow, but most frequently is a milky, chylous, opalescent fluid, and always possessing the property of spontaneous coagulation.

In either of the classes of effusion the fluid may contain blood, cholesterine, more or less of the common serous exudation, and some inflam-

matory product. The chylous effusions are rich in solid matter, albumen, fatty matters, chloride of sodium, and sometimes contain bile, sugar, phosphoric acid, lime, and other undetermined substances, also pus and blood. They are either chyle with moderate admixture of extraneous elements, or chyle-like with more or less chyle dilution with peritoneal effusion and lymph.

The appearance and chemical and microscopical composition of the fluid in chyle and chylous effusions are easily understood, but why the fluid in lymphocele and other lymphorrhagiæ, or found contained, either in a fluid or partially coagulated condition, in lymph-cysts, sacs, or developments, should so uniformly exhibit the appearances and physical and chemical properties of chyle, is not so susceptible of explanation. Numerous observations and analyses have been made of the fluids emitted in cases of lymphorrhœa and lymphorrhagia, and, with rare exceptions, it has been characterized as an opalescent, lacteous, or chylous fluid, rich in lymph-cells, albumin, and fatty matters, coagulating quickly and spontaneously. In all such cases lymph-stasis was the single condition uniformly present, and the alterations in the constitution of the lymph consisted chiefly in an increased proportion of fibrin, the addition of numerous cell elements, not unlike endothelial cells, white blood corpuscles, occasionally red blood-corpuscles, lymphoid cells, granular matters, a varying quantity of albumen, and fat.

Various theories have been suggested in explanation of this transformation of lymph. The theory of chyle regurgitation is altogether untenable. Buchanan maintains that the explanation of the white fibro-serous discharges must be sought "in the morbid activity of the multitude of epithelial cells, the function of which had become perverted," by which the fatty matter was eliminated from the blood. Petters offers the theory that the chyle-like fluids are due to fatty degeneration of the endothelium and other formed elements, and in the decomposition of protein substances, which processes are brought about by lymph-stasis. Carter insists that the fluid was chyle flowing in a retrograde current from the lacteals through vessels defective in anatomical construction and directly connected with enlarged lymph glands. Fetzer suggested the absorption by the lymph vessels of the fat tissue of contiguous parts. Roberts held that the structures which produced these discharges "were anatomically related to the lacteal and lymphatic tissues, which, in consequence of hypertrophic development, had acquired "the property and functions of the cells lining the lacteal ducts and glands." Sédillot attributed the milky appearance of the fluid in Vidal's case to the presence of an infinite number of zoöspers, but their presence has been disproven; and Goselin expressed the belief that it was produced by a combination of the cholesterine and fatty constituents, but cholesterine has been but rarely found in such discharges. In view of the fact that the collections and

discharges of such milk-like or chyle-like lymphous fluids are so generally, if not always, associated with thrombosis, narrowing, dilatation, or occlusion of lymph channels, and lymph-stasis, the conclusion seems inevitable that they are pathological products.

The fluid in cases of fatty and oily ascites, associated with cancerous or tubercular diseases of the peritoneum or other abdominal viscera, is not necessarily a product of such morbid conditions, for in such cases the disease may invade the lymph and chyle vessels, and cause rupture or perforation. Perforations were found in the cases reported by Whitla and Straus; in the former the peritoneum was studded with tubercles, and in the latter it was cancerous. In Guttman's case the oily fluid was apparently the product of a chronic idiopathic peritonitis. In all cases in which the thoracic duct, lacteals, or lymph vessels are diseased the presumption is in favor of perforation and escape of chyle and lymph into the cavity. In a few cases complicated with peritoneal or visceral tuberculosis or carcinoma, the lymph and chyle vessels were normal. In such cases Debove maintains that fat is formed in the peritoneal cavity.

TREATMENT OF CHYLOUS ASCITES.

In twenty-three of the fifty-three tabulated cases tapping was practised, and, in most of the cases, repeated several times. Six of these recovered. In two cases laparotomy was resorted to, with recovery of both patients. One was a case of an intact retention-cyst, and the other was, probably, a ruptured cyst. In the case of congenital cyst recovery took place after several tappings. In two of the cases of recovery, rupture of the umbilicus occurred with spontaneous evacuation of the fluid. The frequent resort to paracentesis was manifestly due to mistaken diagnosis. As a medical resource its value is questionable. The peritoneum is an enormous absorbing surface, which, in cases of moderate effusion unaccompanied with tension of the abdominal walls, might prove adequate for the reabsorption of the effused chyle and lymph. In cases of large accumulation, with its consecutive disturbances of the circulation and respiration, relief of the distention by the evacuation of fluid would be imperative, but it does not seem wise to empty the cavity completely of a nutritive fluid absorbable through such a vast area of lymphatic apparatus.

The treatment has mainly been directed to the prolongation of life, and Murphy suggests that in "cases due to rupture of a chyle-duct it should be rest in bed, with light diet of such foods as are digested and absorbed by the stomach, . . . given in small quantities at short intervals, and a restricted quantity of water and other liquids, the object being to prevent distention of the ruptured ends of the lacteals and the formation of a coagulum." This, together with a general tonic plan of

treatment, has, apparently, proven successful in at least two cases, and has certainly prolonged life in other cases.

The causative condition may, in some cases, be amenable to medicinal treatment; but in most cases, especially in those in which the effusion is attributable to the pressure of a benign tumor, some surgical procedure might offer a prospect of cure. In case of chylous cyst (50) removal is certainly justifiable.

In filarial cases the treatment applicable to such would be admissible. Guitéras asserts that patients "with filaria can hope for no permanent relief, except in the death of the adult worm. This happens occasionally, but cannot be brought about by treatment." Sonsino thinks some good may be accomplished in filarial diseases by the employment of astringents, such as gallic acid and the tincture of the chloride of iron together with rest, tonics, and proper alimentation, but that alimentation must not be pushed to the point of repletion and distention of the lymphatic vessels.

Lancereaux asserts that filariosis, a term which he applies to the parasitic forms of lymphatic diseases, is curable, though it may last for some time. He has found mercurial inunction in the region of the affected glands of service, in connection with hydropathy, and suggests the injection of parasitocides into the affected lymphatic ganglia to destroy the female adult worm. He, as do others, asserts that removal from the source of infection may result in spontaneous cure.

SOME OBSERVATIONS ON THE HEREDITARY FORM OF CHOREA, WITH THE REPORT OF A CASE.

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VON ZIEMSEN,¹ in his comprehensive and exhaustive treatise on chorea, says, under the head of etiology: "Hereditary transmission does occur, but is certainly rare; but hereditary *tendency* to chorea, as to other diseases of the nervous system, . . . is very often demonstrable." He makes no further reference to the subject, except to quote Huntingdon's remarkable report,² in which there are related the records of several families living on Long Island, nearly all of the members of which were affected with chorea. Huntingdon and his father and grandfather together were able to trace a relationship between these families, and a direct hereditary transmission of the disease through

¹ Cyclopædia of the Practice of Medicine, vol. xiv. p. 423.

² Medical and Surgical Reporter, April 13, 1872.

several generations. In these cases the disease began between the ages of twenty and forty, attacking men and women alike. If a fortunate brother or sister of these choreics escaped the affliction, his or her children were also exempt.

W. P. Herringham,¹ in an admirable critical digest on "Chorea in the Adult and in the Old," says: "Chorea is not a common disease in persons after thirty years of age, and the records of it are scanty; but the term is used of so many different classes of illness, that it is worth while to arrange and classify the cases at present recorded." He makes four classes, or divisions, as follows:

First, chorea attacking elderly or old people, which is very similar to the disease of childhood in method of onset, symptoms, duration, etc. Rheumatism is less frequently an antecedent, and organic heart disease is not so common. Cases by Roger,² Russel,³ Saundby,⁴ Ferguson,⁵ Graves,⁶ and Gauthier⁷ are cited.

The *second* group comprises those cases dependent upon a coarse sub-cortical lesion. They often follow, but sometimes precede, hemiplegia. The lesion is usually a patch of softening. Hemichoreics are the chief class in this group.

The *third*—and the class I wish especially to consider—comprises those cases of the disease first appearing in adult age and continuing for years—usually until death. Members of the same family are affected, and direct hereditary transmission is easily traceable. Huntingdon is accredited with the first description of such cases in 1872. Mention is made of reports of cases by Ewald,⁸ Peretti,⁹ King,¹⁰ and others.¹¹ The case which I shall hereafter record belongs to this class.

The *fourth* group, as it concerns us but little, I will not consider, except to say that it comprises all the remaining cases of chorea in the adult and in the old which cannot be placed in any of the three preceding classes.

Herringham's classification, while it can be of little scientific use, in view of our present scanty knowledge of the pathology of chorea in the adult, yet is convenient, and serves a practical purpose. Hammond,¹² in his vast experience, has seen but four choreics in whom the disease began after thirty, and in none of them are we told there was a family

¹ Brain, April, 1888, p. 134.

³ Medical Times and Gazette, 1879, ii. 447.

⁵ Lancet, 1885, ii. 92.

⁷ Journ. de Méd. et Chir. Prat., 1881, 411, 66.

⁸ Zeitschr. für klin. Med., vii., Supplement H, p. 51.

⁹ Berliner klin. Wochenschr., 1885, No. 52.

¹⁰ New York Medical Journal, 1885, i. 468.

¹¹ In a second critical digest (Brain, October, 1888, p. 415) Herringham gives a more extended consideration to this class of cases.

¹² Diseases of the Nervous System, p. 715, 6th edition.

² Gazette des Hôp., 1854, xxvii. 559.

⁴ Lancet, 1884, ii. 948.

⁶ Clinical Medicine, i. 537.

history of chorea. With few exceptions, all the literature on the subject has sprung up since the date of the sixth edition of Hammond's book (1876).

Herringham, in his critical digest, made as late as last year, speaks of hereditary chorea as making the smallest of the four classes into which, we have seen, he divides chorea of the adult and of old age. A brief reference to reports of some cases which have come to my notice may, I trust, prove instructive.

Wharton Sinkler,¹ in discussing the subject, makes reference to Huntingdon's report of hereditary chorea as being the first. Clarence King,² in a valuable contribution to the subject, shows that mention was made of the hereditary chorea by C. O. Waters,³ of Franklin, N. Y., as early as 1841, while Irving W. Lyon's⁴ paper also antedates that of Huntingdon. In these cases, insanity and a tendency to suicide were common. I am unable to find reports of any cases between the years 1872, the date of Huntingdon's monograph, and 1881, when M. D. McLeod⁵ makes an interesting contribution to the subject. He relates the cases of two sisters, admitted to the Cumberland and Westmoreland Asylum, Carlisle. These women had two brothers who were choreic. Their father also had had the "shaking disease" for many years before his death.

CASE I.—Isabella S., aged sixty-two, married, housewife, "peculiar" in disposition, admitted December 5, 1876, having been choreic for two years previous to that date. All muscles affected equally, apparently. Cessation of movements during sleep; mentally, irritable and childish. Physical health good. Short time before death twitchings became less frequent and intense on right than left side. Mental and physical powers gradually failed. Died August 19, 1880.

Autopsy.—Under dura of vertex and sides of left hemisphere there was a cyst lined with thick and dark-colored false membrane. The cyst extended over an area of brain comprising the posterior part of the frontal and whole of the parietal lobes of the left side; convolutions under this growth were depressed and flattened. Large gliomatous bodies on the choroid plexuses.

CASE II.—May B., widow, aged seventy-two, admitted September, 1879, sister of Isabella S. (Case I.). Choreia of two years' standing. Twitchings well-marked and general. No movements during sleep; great mental stupor. Paralysis of both legs. Died January 19, 1880.

Autopsy.—Several tumors in the texture of the dura mater; largest of them, about the size of a chestnut, was located in the upper part of the left hemisphere. Clustered around it were a number of small tumors, about the size of peas. They produced a distinct depression at the roots of the first and second frontal convolutions, and in the upper part of the ascending frontal and parietal convolutions, thinning, but not entirely destroying, the underlying cortical matter. The tumors were of hard, scirrhous nature; arteries atheromatous.

In several respects these cases differ from so-called "hereditary chorea," but, on the other hand, they show a far greater resemblance to that

¹ System of Medicine, Pepper, vol. v. p. 440.

² Medical News, July 13, 1889.

³ Dunglison's Practice of Medicine, 3d edition.

⁴ American Medical Times, December 19, 1863.

⁵ Journal of Mental Science, July, 1881.

affection than they do to any other disease. If it were doubted that the father had chorea, would not the fact of the existence of the disease in the two brothers be strong presumptive evidence of heredity as a prominent etiological factor? I assume that they properly come under the head of "hereditary chorea." It seems remarkable, indeed, that in both cases such gross cortical irritants or destructive agents should have been found *post-mortem*. If these cases had been under medical observation in their beginnings, perhaps, too, it would have been noted in each case that the movements began on the side opposite to that of the brain upon which the growth was situated. Is it not likely that the disease affecting the two brothers of these women is also dependent upon a coarse lesion of the brain or its envelopes?

Ewald¹ records the instance of a family in which nine persons, representing three generations, were choreic. He also speaks of a mother, who, with her two daughters, was affected—the disease beginning in all cases after the age of thirty years. King has three times recorded cases of hereditary chorea. In his first report in 1885² he describes the disease which affected many members of one family in three generations. More or less insanity was noted in all these cases. December, 1886, he reports another case.³ In July of the present year he makes a third report.⁴ Mrs. C., who died of chorea at an advanced age (having been affected many years), had four children, only one of whom, Abel C., was affected with the disease; the other three children escaped, and none of their children developed chorea. Abel C. had six children, all of whom lived to have families. Two of his children, a son and a daughter, became affected. The son now is the father of two children who are said to show signs of the disease.

These cases would seem to be a strong corroboration of Huntington's law, that if one member of a family escape the affection the hereditary influence is stamped out in his branch of the family.

West gives a good description of a family of choreics. Huber⁵ records a series of cases: A man, aged thirty-eight years, had been choreic eight years; movements exaggerated and universal. His sister, father, two paternal uncles and an aunt, and paternal grandfather and great-grandfather were affected.

Zacher⁶ records a case of a man, aged forty-five years, who had developed the disease four years previously. He was committed to a hospital for the insane with the history that he had often abused his wife since

¹ Zeitschr. für klin. Med., vii., Supplement H, p. 51.

² New York Medical Journal, 1885, i. 468.

³ Medical Press of Western New York.

⁴ Medical News, July 13, 1889.

⁵ Virchow's Archiv, Bd. cviii., H. 2, 267, 268.

⁶ Neurol. Centralblatt, January 15, 1888.

the advent of his affection, and was subject to violent attacks of rage and excitement. Physical health was good; all muscles affected, and patient walked with great difficulty; speech was also much affected. By a strong effort of the will he was able to write his name. Entire quiet of muscles during sleep. The patient's grandfather was choreic, and transmitted the disease to one daughter and one son; his remaining child, a son, did not develop the affection. The daughter had seven children, three of whom had developed chorea—one of the three being the patient. In all the cases where a reliable history was obtainable it was found that the disease began between the ages of forty and forty-two years.

Hoffman¹ reports four cases under his observation—two brothers and a sister of one family, and a female cousin. They all developed the disease between the ages of thirty and forty years, except one who has had epilepsy since the age of two or three years, and who became choreic while yet attending school. The disease was shown to have run through four generations, attacking, in all, thirteen individuals.

None of the children of the fifth generation, all of whom are under twenty-four years of age, have yet developed the disease.

Lannois² reports cases of a brother and sister who inherited chorea, and adds a summary of cases already published.

Ducellier³ gives a lucid description of a typical case.

Dr. Gershom H. Hill, Superintendent of the Iowa Hospital for the Insane, furnishes me with the following notes of a case of chorea under his care in that institution:

Mary S., aged fifty-five, married, but childless. Chorea began insidiously twelve years ago, and has steadily increased until she is now hardly able to walk, feed, or dress herself. Her mind has been affected for about two years. An uncle is choreic, and a brother is seriously threatened with the same disease.

From the hospital archives Dr. Hill has also given me notes of two additional cases:

Male patient: a case of dementia, admitted fifteen years ago, with history of having had chorea for a long time. He had wandered from home in the winter season, and as the result of this suffered from frozen feet. His feet were amputated, and he died a few days afterward from the effects of the operation.

Two years ago a brother of this man, aged forty, was admitted to the hospital, having been affected with chorea six years. He died of exhaustion, after a residence of twenty-one months in the institution. The history states that a sister of these two patients has been insane, but does not inform us as to whether or not she had chorea.

¹ Virchow's Archiv, cxi. 3, 513.

² Revue de Médecine, August 10, 1888.

³ L'Encéphale, December, 1888.

For notes of the next case—one in the State Lunatic Asylum, Utica, N. Y.—I am indebted to the Superintendent, Dr. G. Adler Blumer :

Female, aged fifty-six, unmarried. Insanity began 1884, and was coincident with the appearance of chorea. On admission her mental condition was that of melancholia. She has since become somewhat demented. Chorea has gradually increased. Her mother and a maternal cousin had chorea. In the case of her mother chorea came on during the last years of life (a number of years after the birth of the patient). She has no heart trouble and never has had rheumatism.

I will now give the principal points of interest I was able to gather in a case under my care in this hospital :

Hannah B., aged forty-seven years, widow, mother of four children, ranging in ages from nine to twenty years, was admitted to this hospital July 9, 1888, on the usual certificates of insanity signed by two qualified practitioners.

Statement which accompanied the certificate recites that she had been "weak-minded," and affected with St. Vitus's dance for the past six or eight years ; she had threatened to poison some of her neighbors, and also to take her own life ; and on one occasion actually did attempt suicide by drowning. Her normal disposition, which was quite amiable, has become perverted, and she is now peevish, irritable, and querulous, prone to sudden and violent fits of anger. Often, too, she is very despondent, and during such periods she has threatened or attempted violence to herself and others.

Condition on admission.—Rather spare frame, a little above the average height ; dark eyes and hair, dark complexion. Facial lines deep ; expression somewhat melancholic. Presents the appearance of one enjoying fair physical health. No abnormalities of organs of respiration, circulation, digestion, or excretion are noted ; appetite good. Choreic movements noted in face, neck, arms, legs, and trunk. When she is alone, sitting or lying down, there is great diminution in the intensity of the movements. On one occasion like this the muscles of the neck were the only ones which appeared to be disturbed. Mental excitement or physical exertion causes great exacerbation of her symptoms. The effort necessary in talking causes marked exaggeration of the movements ; but they can, in a large measure, be controlled by an effort of the will. All movements are arrested during sleep.

Present condition.—Physical condition is rather improved upon that noted upon her admission. She is usually melancholic and disposed to rail at friends and authorities by whom she was placed here. It is not known that she has made any threats of suicide or homicide since her advent to the hospital ; but she is restless, irritable and quarrelsome, and often provokes to anger the other patients in the ward. Effort of talking always greatly increases the movements. An attempt which she made to write her name proved a failure—the first letter being the only one which was legible. It is only by considerable effort she walks ; several times has fallen.

Her appetite is apparently insatiable. She often provokes and angers the other patients in the dining-room by appropriating to her use food and drink intended for others. Although her liberal allowance of food

has been increased, her propensity for "foraging" among her neighbors is still apparently unabated.

Family history.—Our patient, the fourth child of her parents, has nine brothers and sisters—all of adult age, and four of whom are choreic—two sisters and two brothers. The father of these children, two paternal aunts, and two paternal uncles had the "shaking disease" for many years. Mrs. B.'s grandfather was also undoubtedly choreic.

One of Mrs. B.'s children had an attack of chorea at the age of eight, which lasted about two months. The child entirely recovered from this, which appears to have run the ordinary course of chorea of childhood. Mrs. B.'s uncles and aunts who were choreic all married and had children, but I was unable to ascertain that any of them inherited the family malady. None of the children of her four choreic brothers and sisters have developed the disease, but they are all under twenty-five years of age. To sum up: In one family we have eleven cases of chorea in three generations, or twelve cases in four generations if we include the case of Mrs. B.'s child, who, we have seen, developed the ordinary chorea of childhood.

This history I have verified from several sources, and as far as it goes I believe it to be entirely correct. The patient herself was able to give me a good deal of information, which was afterward corroborated by statements of a relative who visited her. The family is now scattered, and it is likely that there are members who are affected other than those here recorded.

I was unable to learn definitely the time of life at which the affection appeared in each of these cases, but in the instance of Mrs. B. it was at the age of forty, and I am inclined to believe that all or most of the others developed the disease at or about that time of life. In no case has a recovery ensued, but, on the other hand, they all tend to a progressive exaggeration of the disease. Various degrees of mental symptoms developed in most cases, from an undue irritability of temper to the degree represented by our patient, who is the only member of the family who has ever been in an insane asylum. The neurosis, however, does not appear to be incompatible with a fair degree of physical health, some of the members of the family having had the disease for many years prior to their deaths—in one case as long as twenty years.

REMARKS.—An interesting and unique feature of the history of this family is the chorea which Mrs. B.'s child developed at the age of eight, and which apparently ran the ordinary course of the disease common in childhood. I am unable to find an instance similar to this in the writings of any of the authorities whom I have quoted in this paper. Would not a case like this be an argument against the views of those writers who maintain that chorea of old age, and especially "hereditary chorea" or "Huntingdon's disease," is essentially different from the affection seen in childhood—not because it is dependent upon a different morbid process, but because of the difference in clinical histories and in the durations of the two troubles?

The *Lancet* of August 17, 1888, in an editorial comment, says:

"Ordinary chorea is sometimes hereditary, but the disease called 'hereditary chorea' is, in many respects, different from the chorea of childhood. The

distinction . . . rests . . . rather upon the characteristics, and chiefly upon the time of life at which the diseases become prevalent, and upon their observed progress. Child chorea ever tends to get better . . . ; whereas hereditary chorea once established never ceases to exist. Hereditary chorea is frequently, child chorea is rarely, attended with marked mental chorea, if such a phrase may be allowed to signify the jerky, weak intellectual and moral actions of the sufferers."

This concise *résumé* is accurate in every statement, and while I readily subscribe to all it contains, I cannot see that there is adduced sufficient reason to warrant the invention of a "brand new" disease with half a dozen synonymous names.

PATHOLOGY.—I assume to be correct the theory, as promulgated by Hughlings-Jackson and Broadbent, that chorea of childhood is dependent upon certain changes or disturbances in the cerebrum. But the fact that small cerebral emboli have been found *post-mortem* in children who have had rheumatism, with endocarditis, does not prove that chorea of childhood is solely dependent upon this cause. Many cases have been recorded in which the hearts were healthy and where diligent search failed to discover any emboli in the brain.

In cases where emboli are found in the corpus striatum, or other parts of the brain, it seems a very plausible example of cause and effect. But how are we to account for those cases where a critical examination of the brain gives a negative result, or, at most, shows some excess of serum, or a slight meningitis?

Koch's theory is very inviting. He says there exists a choreic virus or blood dyscrasia, which in some cases produces chorea, in others rheumatism, and again in others both these affections.

The pathological records of cases of "hereditary chorea" are so meagre that we have but little opportunity to study the subject.

McLeod's report of the cases of two sisters affected with "hereditary chorea," in both of which gross lesions producing cortical pressure were found *post-mortem*, seems to me to afford food for much thought. Might not the father of these women have also suffered from a similar lesion, and transmitted to his children an hereditary tendency to intracranial growths? Perhaps it was syphilis. Certainly his nerve functions were weak. I am inclined to think that records of autopsies which will be made in the future will show that the affection is not dependent upon any one well-defined morbid process, but, like epilepsy, upon a variety of changes in the brain or its envelopes, all producing essentially the same motor disturbance. I believe, further, that the only difference between chorea of childhood and that of adult age and old age (including the hereditary variety), will be shown to be simply a difference in the length of time the causes operate, the effect on motor cells or tracts and the symptoms produced thereby being practically the same. A choreic virus, a blood dyscrasia, or a number of

minute emboli may soon disappear. The existence of these causes is too transient to produce an injury or "habit" from which the motor apparatus of the brain cannot recover. On the other hand, in adult age all diseases have a greater tendency to become chronic than they do in childhood. Gross brain lesions, such as those in McLeod's two cases, are a permanent and lasting cause; so is a clot—organized or broken down. Post-apoplectic choreics must be accounted for from this last cause. In some cases delicate chemical changes, or a fine general sclerosis, may be the permanent excitant or irritant. Here it might be difficult or impossible to demonstrate the changes, and then the disease would be said to be "functional."

Congenital chorea and cases where the disease began in childhood and continued many years, may be considered as arguments favoring the views I have here ventured to express.

Cases in which chorea and epilepsy exist in the same individual at the same time, or in which the one affection has followed or supplanted the other, are also instructive as bearing upon this subject.

Dr. C. B. Mayberry has under his care in this hospital a case of this kind:

A boy, aged sixteen years, has chorea alternating with epilepsy. He never has a fit during the time of the existence of the choreic movements. The choreic movements last from one to three weeks, and after an interval of about the same length of time, they will again become manifest. During this interval, epileptic fits are of frequent occurrence—ten or fifteen in a day having been noted. Fowler's solution has a marked effect in controlling both of these manifestations of motor explosions, as has also bromide, though in a much less degree.

The diseases of the motor apparatus of the brain are not always so clearly defined and distinct from each other, either in morbid anatomy, symptoms, or course, as some authorities would lead us to believe; but on the contrary, are often so associated with each other that a precise diagnosis is difficult or impossible.

Would it not, then, be better to group and classify these diseases, and thus work in a broader and more comprehensive way, rather than to make artificial distinctions, with the consequent multiplication of names and synonyms? Let us not, at present, make two diseases out of chorea, but simply call each a *variety* of the same affection—at least until we have added much more to our knowledge of this interesting neurosis.

A CASE OF URTICARIA PIGMENTOSA.

BY HENRY W. STELWAGON, M.D.,

OF PHILADELPHIA.

IN looking over the literature of urticaria pigmentosa the impression was forced upon me that there was in almost all the published cases a marked similarity in the objective phenomena: the subjective symptom of itching was found, it is true, somewhat variable, and in a few cases, as in that about to be reported, practically *nil*. Itching is to be considered as almost a *sine qua non* of urticaria, and this is always of an annoying character. Indeed, in studying the cases of urticaria pigmentosa carefully, I am constrained to confess that while many of the symptoms point to a close resemblance to true urticaria, in other respects they are so different that as yet their identity can by no means be admitted. This impression is further strengthened by the fact that these anomalous cases stand so prominently divided from simple urticaria, that midway cases (if the expression may be allowed) are not encountered—it is either urticaria, with its evanescent and characteristic wheals, etc., or it is urticaria pigmentosa with its usual symptoms. This sharp division is not in accord with our experience in other cutaneous diseases. The following brief notes, therefore, I wish to put on record, so as, perhaps, to add something to the final status of these cases.

The patient, a boy of six years, came under my notice in the early part of last February. He was a blond, of robust physique, and in perfect health. In fact, no departure from health could be elicited other than the skin eruption for which advice was sought. The parents were also free from disease. In earlier life, and also in the summer preceding the patient's birth, the mother had had urticarial attacks of the usual evanescent type, and due to dietetic indiscretions. The boy's sister, the only other child, had always been free from any cutaneous disease.

The eruption began, as the father stated, after two unsuccessful attempts at vaccination, when the boy was eighteen months old. Since that time, a period of four and a half years, the disease had continued uninterruptedly. The eruption appeared without any attempt at regularity, new lesions, few or in numbers, making their appearance from time to time. The covered regions of the body were the parts upon which the spots were most abundant. Lately, however, there had been a strong disposition to appear on the face, and it was this disfigurement chiefly that had made the parents solicitous of remedial help. The lesions had always been numerous about the neck, sides of the trunk, and about the genitalia; until recently comparatively few had been on the limbs and face. The eruption has been active ever

¹ Read at the Thirteenth Annual Meeting of the American Dermatological Association, September 18, 1889.

since its first appearance, the older lesions eventually disappearing without leaving a trace. Itching had never been a troublesome symptom.

At the time of examination the eruption was found to be more or less general, being most abundant on the lateral portions of the chest and abdomen, on the neck, on the under part of the lower jaw, on the forehead and temples, on the back of the neck well up to the post-aural regions, and to a less extent on the arms and legs. On the face proper there were comparatively few. The eruption consisted of pin-head to large pea-sized rounded, some elongate, reddish-yellow, papule-like elevations; many similar elevations surmounted with a small vesicle with a somewhat thick and light-yellowish epidermal covering; flattened, elevated, small and large pea-sized yellowish or salmon-colored lesions; small spots of pale-yellowish pigmentation, with slight, if any, elevation; spots of similar size, of the color approaching the normal skin, with possibly a yellowish tinge, over which the epiderm appeared slightly loose and wrinkled, and in some the follicular outlets seemed enlarged, giving the appearance faintly similar to the slight atrophy which follows lupus erythematosus. Some of the retrogressing lesions, those which were still somewhat elevated, bore a slight resemblance to both lupus deposits and to xanthoma. The most prominent color was yellow, somewhat on the salmon. In the early life of a lesion, however, a reddish tint was probably the more noticeable. The first appearance of a lesion was, in fact, somewhat similar to the wheal of an ordinary urticaria, although smaller and less inflammatory. Such beginning lesions were to a slight degree itchy, but this was evanescent and never marked or persistent. The skin on being rubbed exhibited a slight tendency to become urticarial.

This was, in brief, the extent and character of the eruption when first seen, and it may here be added also that in the examinations made subsequently the same essential phenomena presented. The lesions, no doubt, finally disappeared, probably in the course of months, without leaving a trace; at least this must be inferred from the fact that the disease had already lasted four and a half years, with continuous outbreak of new lesions, and yet with so comparatively few of the atrophic-looking and the freckle-like spots remaining. These last-named would undoubtedly give place to normal skin. The fact of the total disappearance of the lesions the father also attested.

An observation extending over some weeks showed the eruption in its formation and evolution as follows: The lesions began as small rounded, solid elevations, reddish-yellow in color, developing suddenly or in the course of several hours or days. On many of these a more or less perfect attempt at vesiculation occurs. The vesicle is small and the epidermal covering thick, giving the vesicle a yellowish color, although the contents remain clear and purely serous. The vesicle disappears by absorption. The spots, as a rule, become a trifle larger, after they are apparently fully developed; they flatten out, and then look like flat, pea-sized yellowish or yellow-brown maculo-papules, being a part apparently of the skin itself; suggesting in some respects a slightly elevated hairless pigmented nævus, and in other respects a superficial flattened xanthoma. Still further flattening gradually takes place, and the

epidermis covering the lesion assumes a slightly loose or wrinkled appearance, in some with a tendency toward thinning or atrophy, with also an apparent, and probably true, enlargement of the follicular outlets, suggesting, as already remarked, a faint resemblance to the sieve-like atrophy of lupus erythematosus. These characters—the atrophic and wrinkled appearance and the enlargement of the follicular orifices—could only be seen, however, by close inspection, and were not, therefore, in the slightest degree striking or conspicuous. Indeed, unless the skin were carefully examined these later changes would entirely escape observation. Nor were these characters an essential part of each disappearing lesion. Many spots apparently disappeared without this preliminary atrophy taking place. Whether atrophic or otherwise, however, no permanent trace of the eruption was left, the skin finally assuming its natural condition and color. These several stages—the formation, evolution, and disappearance of a lesion—required weeks, and doubtless in some lesions months. As it was, unfortunately, impossible to gain the parents' permission to excise a lesion, no microscopical examination could be made.

A few words as to treatment. In the reported cases of this disease treatment, except the partial relief to the itching by external applications, was practically negative, and the same may be said indeed in regard to the case here given. Treatment is essentially theoretical and experimental, and must necessarily remain so as long as the nature of the disease and its underlying causes are unrecognized. Before coming under my observation this boy had been variously treated, in one instance taking fair doses of arsenic continuously for several months, but without the slightest effect upon the eruption. With the idea of possibly influencing the vaso-motor nerves and indirectly the disease, the fluid extract of ergot was prescribed, at first in ten minim doses t. d., later increased to twenty minims, and the same was continued for five weeks, but the condition was in no way modified or improved, the older lesions gradually changing as formerly and new lesions appearing from day to day and week to week. This was now discontinued, and the phosphates in combination with cod-liver oil given as a nutrient tonic. I may add that there was no other indication for this than that the boy was of the appearance and complexion so common to strumous subjects, who while presenting a tolerably robust appearance are lacking in nervous tone and muscular vigor. At the end of a month the disease appeared less active, but this was in all probability, however, independent of treatment, as not infrequently before, so the father stated, there had been times when the disease was comparatively quiescent. The same remedies, with the addition of a small tonic dose of arsenic were continued, and so far as I have been able to learn this treatment was followed for several weeks longer, but as it was without further appreciable effect, was discontinued, and other advice sought.

REVIEWS.

ANÆSTHETICS, ANCIENT AND MODERN: THEIR PHYSIOLOGICAL ACTION, THERAPEUTIC USE, AND MODE OF ADMINISTRATION; TOGETHER WITH AN HISTORICAL RÉSUMÉ OF THE INTRODUCTION OF MODERN ANÆSTHETICS—NITROUS OXIDE, ETHER, CHLOROFORM, AND COCAINE; AND ALSO AN ACCOUNT OF THE MORE CELEBRATED ANÆSTHETICS IN USE FROM THE EARLIEST TIMES TO THE DISCOVERY OF NITROUS OXIDE. By GEORGE FOY, F.R.C.S. London, 1889.

THE title and the dedication of this book are both good. The first is given above; the second is to Hunter McGuire, not only as a token of personal friendship, but as a just tribute to one "whose numerous brilliant and successful operations have made his name honored and esteemed in two hemispheres."

An examination of the body of the work shows it to consist of one hundred and fifty pages. Of these, about twenty are devoted to cocaine, fifteen to the scarcely used anæsthetics, such as methylene, ethylene, amylene, and others, and ten pages are occupied with cuts of inhalers and apparatus. It is needless to say that an attempt to consider the subjects of the title-page in the remaining space could but result in failure for the author and disappointment for the reader.

The work is sharply divided into two portions, historical and practical. In the former are some curious gleanings, and it shows wide reading and a study *con amore*. Why, however, a case of early inhalation of nitrous oxide gas should be given, occupying two pages, which shows only the production of *unconsciousness*, or what bearing it has upon the discovery of the anæsthetic effect of that gas, we cannot imagine. On page 23 we find the following paragraph:

"To Faraday, however, may be credited the recognition of the value of ether as a surgical remedy; in 1818 he showed that the vapor of sulphuric ether, when inhaled, produced anæsthetic effects similar to those produced by nitrous oxide gas."

Surely so important a statement, one so sweeping in its changes of history, should be sustained by quotation from Faraday's works. There is none, and not even a reference to the sources upon which the statement is made, although the book abounds in quotations and foot-notes.

We also challenge the statement (p. 103), that to late independent workers "we are principally indebted for our modern views of the physiological action of anæsthetics, and the best means of avoiding danger during their use." The name of John Snow does not occur in the book, nor is there a reference to his work, 1858, which was at once pioneer, almost exhaustive, and scientific. But few things on the points mentioned have been added since his day.

Coming to the practical or clinical portion of the book, we find the author an advocate of chloroform as against ether. He does not display any partisanship, but it is plain from the greater attention paid to the one than to the other. Supposing the conditions present suitable for the administration of ether, he says, "there can be no objection to chloroform;" and "there are no cases in which ether may be used that chloroform is not equally suitable." How much it is to be regretted that just here the author had not looked through the files of the leading British journals for a few years past. He would have found the announcement of "a death from chloroform" so frequently that we are sure these statements would have been modified.

The origin of the A.-C.-E. mixture is fully and correctly given by quotation from the report of the Committee of the Royal Medico-Chirurgical Society, 1864. But no information is furnished as to probable frequency of administration of this combination in the author's country, no statement for the benefit of the student of the advantages claimed for it over ether or chloroform given alone. No mention is made of the Vienna mixture, with which Billroth has had large experience and no disaster, although two pages are devoted to the administration of chloroform and oxygen gas.

The important subject of mixed anæsthesia by a preceding injection of morphine occupies less than a page; while nothing is said of the addition of atropine. This procedure is spoken of as "once strongly advocated," and that it has now fallen "into disrepute and is rarely resorted to." Both theoretically and practically, so far as it has been carried, this is one of the most important modifications of the process of artificial anæsthesia. It has the firm support of experiment on animals and clinical experience, and we believe its use is extending, although more gradually than it deserves to be. In the author's references to Bernard, the one who first placed this method on a scientific basis, there is none to his *Leçons sur l'Asphyxie et les Anæsthetics*, in which may be found facts which would compel a far stronger presentation of the method.

Looking carefully for original work, for additions to our knowledge, it is difficult to find any. The author has seen a death under chloroform "from the administration of too concentrated a vapor"—a cause which has frequently caused the fatal result—yet he does not give the particulars of even this, but merely mentions it. We except from the general statement above the presentation (pp. 101, 102) of the number of administrations of the individual anæsthetics at St. Bartholomew's Hospital for three years. This is so interesting and valuable that we give it, as the book will be seen by but few of our readers:

	Chloroform.	Ether.	N. O. Gas.	Ether preceded by N. O. Gas.	Deaths.
1885	1331	1118	378	386	0
1886	1425	1109	385	567	1
1887	1702	1197	415	662	1

Even this is incomplete, from failure to state under which anæsthetic the death of 1887 occurred. That of 1886 was from chloroform.

We regret that we cannot speak more favorably of a little work which is evidently the result of a great deal of labor and study. But the duty of informing our readers as to the scope and character of new works upon this subject will not permit it. As before said, the subjects could

not possibly be considered in the number of pages occupied; there is a hydrocephalic disproportion between the head and the body. The administration of nitrous oxide for dental purposes is not touched upon; the medico-legal relations of anæsthetics are given in six lines on erotic manifestations, and their obstetrical uses are not mentioned.

THE CAUSES AND TREATMENT OF ABORTION. By ROBERT REID RENTOUL, M.D., L.R.C.P. Ed. With an introduction by LAWSON TAIT, F.R.C.S. Two colored plates and thirty-five engravings. 8vo., pp. xiv., 271. Edinburgh and London: Young J. Pentland, 1889.

THE subject of this essay is an attractive one. The field has not been overworked in the light of modern knowledge, and its importance is apparent to every one who knows that about one-fifth of all conceptions fail to produce a living infant, that one-fifth of all pregnant women must expect their condition to be prematurely, unnaturally terminated, and who realizes the loss to the community, the danger to woman's health and life, involved in this enormous mortality of the embryo and foetus.

It is disappointing to find that the work under review fails to meet the expectation which its title must arouse. The book is introduced to the public by a laudatory note from Lawson Tait. The choice of the endorser is unfortunate. Mr. Tait is distinguished as a practical operator, but is certainly not widely known for his extensive acquaintance with obstetrical literature or pathology. Mr. Tait's assertion that "I have seen nothing better in the English language," and "the clearness of its expression as well as the precision of its conclusions places it far above the kind of productions with which we are favored in most other languages than our own," will be disputed by every intelligent and educated physician who will read the book.

There is nothing new of scientific value, and the style is discursive, far from clear, and in places exceedingly slovenly. For instance, see the sentences "Martin and Fourcauld have described the cervix as being enlarged, congested, and indurated, and accompanied by ulceration" (p. 36), and "The bleeding which comes from a congested condition of the os" (!) (p. 39). In the sections on pathology and development, especially of the decidua, erroneous statements are advanced. A ludicrous mistake is made upon page 45: the effect of malaria in the pregnant woman is said to be a reduction in the foetal weight on the average of 5000 grammes! Thus does this fell disorder crush the unfortunate infant within the womb to an impalpable essence of—1750 grammes in weight. On page 124 the astonishing assertion is advanced that the foetus may suffer from worms.

The proof-reading has been carelessly done: material appears for maternal, Wagner for Wegner, and Dolores for Doléris. The book has some good features. The author displays creditable industry in collecting facts of interest and importance from other sources. The paper is good, the type clear, and the illustrations in the main excellent, although some of the figures are indistinct, notably Nos. 4 and 5. B. C. H.

AN ESSAY ON ASPHYXIA (APNŒA). By GEORGE JOHNSON, M.D., F.R.C.P., F.R.S., Emeritus Professor of Clinical Medicine; Consulting Physician to King's College Hospital; Physician Extraordinary to Her Majesty the Queen. 8vo., pp. xi., 53. London: J. & A. Churchill, 1889.

DR. JOHNSON'S essay, though mainly a restatement of views previously expressed, is a timely and valuable contribution to the literature of an important subject, inasmuch as the author finds it necessary to take direct exception to statements authoritatively made by such modern writers on physiology and forensic medicine as Klein, Burdon Sanderson, Lauder Brunton, Michael Foster, Gerald Yeo, Landois and Stirling, and the editors of late editions of Carpenter and of Taylor. The point at issue is one which seemingly hinges upon a simple matter of observation about which no doubt could exist. The older physiologists, among whom Dr. Johnson enumerates Harvey, state that after death by suffocation the right heart and its tributaries, as well as the pulmonary artery and its branches, are found engorged with blood, while the pulmonary veins and the left heart, together with the aorta, are empty or nearly so. The later writers, on the contrary, either describe an equal engorgement of both sides of the heart, or account for the emptiness of the left side as the effect of contractions due to *rigor mortis*.

Dr. Johnson, adhering to the older view, and supporting his opinion by the carefully detailed experiments of John Reid, and those conducted for himself by Rutherford, explains the phenomena of apnœa on the theory of a spasmodic contraction of the smaller arterioles in the lungs, brought about by the irritation of the carbonized blood; which contraction shuts off the blood-current from the pulmonary capillaries and all channels beyond them. That the arrest of circulation cannot occur in the capillaries, he considers proved by the demonstrated absence from the capillaries of the muscular "stopcock" apparatus. As to Dr. Foster's experiments, he thinks that this observer may have been led astray by the interference of the paralyzing effect of an overdose of curara with the normal sequence of phenomena. He refers to the phenomena of nitrous oxide anæsthesia, and the conditions observed after death from nitrous oxide, as confirmatory of his views.

The practical importance of establishing the truth of Dr. Johnson's theory lies not only in the more intelligent application of proper means for resuscitation in cases of threatened or apparent death from apnœa; but also in the light it throws upon certain pathological phenomena. Thus the arrested circulation through the lungs in choleraic collapse is attributed to contraction of the pulmonary arterioles excited by the virus of the disease. This, and not deprivation of fluid, is looked upon as the essential feature of the morbid state. In Bright's disease, as long ago pointed out by Johnson, in Raynaud's disease, and in the study of the pulse in various affections, the recognition of spasmodic contraction of the muscular arterioles may throw light upon imperfectly understood processes and afford important hints in therapy. The distinction which the author so properly insists upon, between *asphyxia* or *pulselessness*, and *apnœa* or *breathlessness*, should be constantly borne in mind, and would obviate considerable confusion. One result of Johnson's

labors will be to increase the intelligent therapeutic employment of nitroglycerine and its congeners, in combating conditions which can be referred to this stopcock action of the arterioles. S. S. C.

GYNECOLOGICAL ELECTRO-THERAPEUTICS. By HORATIO R. BIGELOW, M.D., Permanent Member of the American Medical Association, etc. With an Introduction by DR. GEORGES APOSTOLI. With illustrations. 8vo., pp. xliv., 199. London: H. K. Lewis, 1889.

DR. BIGELOW's name is not an unfamiliar one in gynecological literature, and his numerous contributions during his prolonged stay in foreign parts are ample testimony that he has been no idler while there. In the present work nothing new or original must be expected—indeed, Dr. Bigelow admits that it is only a compilation. He adds: "If it be a good one and serve a useful purpose, I am amply repaid." In so far as being a readable book is concerned, it is a fairly good one, though it is very vulnerable.

It is questionable whether in a gynecological work it is well to introduce much that is to be found in the first three chapters, especially the abstruse mathematical formulæ and calculations. Apostoli himself is authority for making the physics of the subject as elementary and practical as possible. Aside from this the book is made up almost entirely of selections from Apostoli's writings, including an analytical introduction by him of thirty pages. Dr. Bigelow is too modest, after his rich experience, in saying "It would have been mere impertinence for me to obtrude my own unformed ideas upon men anxious to learn." We are reduced, therefore, to the necessity of criticising Apostoli rather than Bigelow.

In the first place, we believe that spirit of narrowness and prejudice should be rebuked which sees naught but evil in electricity and Apostoli, *et id omne genus*. There is a style of writing and criticism too rife in certain high gynecological circles which forgets the fair and courteous treatment ever due an opponent, a brusqueness and savageness of expression which, because backed by brains and skill, is tolerated or even smiled at, but which is unpardonable nevertheless. Shafts of this kind without number have been fired at gynecological electro-therapeutics, and Apostoli, and any one else who happened to agree with him. Fortunately that kind of argument is not convincing to a really serious mind. On the other hand, while recognizing the great merit of Apostoli in popularizing the use of electricity, and patiently and courteously pursuing his work in open day, we think he asserts too much as to the therapeutic value of electricity in gynecology, minimizing its possible dangers and never abounding in modesty in his claims as to his share in the development of the subject. He must not ask us to forget or ignore the pioneer work of Cutter, Semeleder, and Tripier in this field, and he should remember that as he has improved upon their methods and armamentaria, others have improved and will improve upon his. For example, on page 77 we have Apostoli's words as follows: "The abdominal electrode of Franklin Martin, of Chicago, is the best I have met with and will perhaps be adopted."

We are not prepared, either, to accept all his physical theories—for example, as to the polarizing action of the galvanic current upon tissues, and subsequent interpolar action (page 69). Certainly there may be polarization, the galvanometer shows that by the deviation of the needle in the direction opposite to that in which it has been deflecting, but to quote Apostoli's own words again (page 141) this is "a deviation which is slight, it is true, and of little intensity." If such a secondary current were of more than momentary activity in the tissues, would not its prolonged presence be indicated by the galvanometer? Again, as to the effects of the scar in intra-uterine cauterization: if the decomposition of the battery fluid effected by electrolysis attracts acids to the locality of the positive electrode, resulting in a scar, why should it differ in character and in consequences from the scar produced by acids of a similar character deposited in the same locality by other means? We do not refer now to any physiological effect which may attend the passage of the electrolytic current. That the galvanic current will stop bleeding we have frequently proven; that it will ease pain we are certain; that it, or the faradic current, will greatly improve the nutrition of relaxed and flabby and anæmic pelvic organs we have demonstrated, and there are numerous other indications which have been pointed out by Apostoli, Engelmann, Franklin Martin, and others.

Tutissimus in medias vias, and this was shown by the discussion of this subject at the recent meeting of the American Gynecological Society by men who were well calculated by experience to speak intelligently thereon. And so in, spite of Apostoli and the good work which he is doing, the time is not yet at hand for us to throw away our scalpels, our pots of iodine and glycerine, our tampons of cotton, our curettes, and our vaginal douching apparatus, but we are watching him without prejudice, eager for *fair play*, and for the best that he can give us.

A. F. C.

PRACTICUM DER PATHOLOGISCHEN HISTOLOGIE. LEITFADEN FÜR STUDIRENDE UND AERZTE. VON DR. OSKAR ISRAEL, I. Anatomischem Assistenten am Pathologischen Institut und Privat-docenten an der Universität zu Berlin. Mit 133 Abbildungen in Text und einer Lichtdrucktafel. 8vo., pp. xiv., 390. Berlin: August Hirschwald, 1889.

A PRACTICAL TREATISE ON PATHOLOGICAL HISTOLOGY. INTENDED AS A GUIDE FOR STUDENTS AND PHYSICIANS. BY DR. OSKAR ISRAEL. First Assistant in Anatomy at the Pathological Institute and Privatdocent at the University of Berlin. With 133 Illustrations and a Photographic Plate.

THIS is an excellent work by a thoroughly competent observer. As implied by its name, it is intended as an introduction to the study of pathological histology and this intention is well carried out; but this does not prevent its containing a large amount of information of great value to the advanced student of this science. The explanations of the various most approved methods of hardening, cutting, and mounting microscopical preparations—the technique, as it is called—are concise and yet complete, while the abundant illustrations are beyond all praise. The work is a valuable addition to the literature of pathological histology.

F. P. H.

DER CATARRH DES RECESSUS PHARYNGEUS MEDIUS; SEINE BEDEUTUNG UND VEREINFACHTE CHIRURGISCHE BEHANDLUNG. Von DR. R. KAFEMANN.

CATARRH OF THE MEDIAN PHARYNGEAL RECESS. ITS SIGNIFICANCE AND ITS SIMPLE SURGICAL TREATMENT. By DR. R. KAFEMANN. Wiesbaden, 1888.

KAFEMANN presents a careful summary of the conflicting views concerning the disputed *bursa pharyngea*; ranging himself among those who find it to be nothing more than a median fissure in the mass of lymphoid nodules at the vault of the pharynx, best known as the pharyngeal tonsil (Luschka). His treatment of catarrhal disease of this structure, by which he claims to secure radical cure, consists in thorough scraping of the tissue with sharp spoons, followed immediately by applications of silver nitrate or of chromic acid molten upon the end of a silver probe. A number of cases are reported in support of his claims.

J. S. C.

OEUVRES COMPLÈTES DE J. M. CHARCOT. MALADIES DES POUMONS ET DU SYSTÈME VASCULAIRE. Tome v. 8vo., pp. 652. Paris: Aux Bureaux du Progrès Médical, 1888.

COMPLETE WORKS OF J. M. CHARCOT. DISEASES OF THE LUNGS AND VASCULAR SYSTEM. Volume v. Paris, 1888.

As admitted by the editor of this volume, who signs himself simply Bourneville, this work, which contains the lectures and other writings of Charcot on the diseases of the lungs, the blood, the heart, and the vessels, is chiefly of historical interest. This is apparent from the facts that some of the observations were published thirty years ago and that the lectures were delivered in 1877.

Prof. Charcot is known throughout the civilized world as occupying the first rank as a specialist in the diseases of the nervous system, and it is evident, from these writings, that he has attained that rank by an almost exclusive devotion to his specialty. Doubtless there are many admirers of this great teacher who will be glad to possess a complete set of his writings, but we cannot advise any one to purchase this fifth volume for the sake of obtaining information of present value on the subjects of which it treats. Its interest is purely historical, literary, and personal.

F. P. H.

OBSERVATIONS ON SOME RARE DISEASES OF THE SKIN. By J. F. PAYNE, M.D. Oxon. F.R.C.P. Lond.; Physician to St. Thomas's Hospital, etc. 8vo., pp. 51. London: Smith, Elder & Co., 1889.

THE diseases considered in this small volume are granuloma fungoides, erythrasma, beaded hair, and pruritus hiemalis. These several papers have already been published in Society Transactions or in current litera-

ture, but are here reprinted with considerable additions. Four plates accompany the text: two colored plates, descriptive of the clinical aspects of granuloma fungoides; one plate with several cuts devoted to the pathological histology of the same disease; one plate with nine cuts showing the fungus of erythrasma and specimens of beaded hair.

H. W. S.

A GUIDE TO THE INSTRUMENTS AND APPLIANCES REQUIRED IN VARIOUS OPERATIONS. By A. W. MAYO ROBSON. 18mo., pp. 60. London: J. & A. Churchill.

THIS little work will fill a long-felt want in the hands of operators, assistants, nurses, and others who are called upon to prepare for surgical procedures, and will also assist the surgeon in giving his instructions. It is a compact, neatly printed, pocket-sized book, with the instruments of every imaginable operation arranged so that one can select them at a glance, and can be sure of avoiding those lapses of memory by which sometimes important instruments or appliances may be forgotten. As surgeons differ somewhat in the choice of their instruments, a space is left at the end of each list for additions. We can heartily recommend it as a useful aid to the surgeon in his operative work.

LEPROSY—AN IMPERIAL DANGER. By H. P. WRIGHT, M.A., Rector of Greatham, Hants, etc. 12mo., pp. 127. London: J. & A. Churchill, 1889.

THE author is evidently a thorough believer in the contagiousness of leprosy, and strongly urges segregation as necessary to prevent possible future epidemics. Facts and arguments are collected from all sources, and so arranged and arrayed as to carry, if reliable, great weight. Apparently a spirit of honesty pervades the whole text, although it receives the high coloring to be expected from a lay author. It is probably as strong a presentation of the subject as could be prepared by a non-medical writer. Whilst doubtless intending to be fair and moderate in his descriptions and assertions, it is possible that the author has permitted his strong prejudice to cloud his vision and obscure his judgment. For instance, in referring to the existence of leprosy in this country, on page 108 is found: "If we leave the city (New Orleans) of the south of the United States, and make for the city of cities, Philadelphia, there also leprosy has been, within the last few months, very active." This is, to say the least, misleading language to apply to the presence of the three accidental cases shown by Van Harlingen before the County Society a year or so ago. Such perverted statement, although probably unintentional, is apt, indeed, to discredit what may in every other particular be a truthful and painstaking labor.

H. W. S.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

CHLORAMIDE.

DR. KNY, of Strasburg, has made a careful study of the action of chloramide, beginning with observations of its influence upon animals. He found that it exerted a marked hypnotic action upon rabbits without exciting any undesirable symptoms; experiments were also made to test the extent of its influence upon the circulation. Since chloral is known to have a depressing action on the heart, Dr. Kny determined to compare the action of these two hypnotics upon the circulation. He found that the blood-pressure was but little diminished, compared with the marked depression caused by chloral, and he inferred that chloramide has but a slight influence upon the heart.

After such a preliminary study of the drug it was used upon patients suffering from insomnia, and in such cases as had already obtained relief from chloral. It is not so energetic a hypnotic as chloral; they are related to each other in about the proportion of thirty grains of chloral to forty-five grains of chloramide. Beside having the larger dose (both of those given are maximum doses), chloramide is the more deliberate in producing sleep. On the average, sleep follows in about half an hour, while with chloral it comes on in about fifteen minutes. The sleep from chloramide is deeper and more refreshing; its duration varies from six to ten hours. The patient rises in the morning with a clear head and free from digestive disturbance. It is a far less irritating substance than chloral, is free from any disagreeable taste, and, what is of more importance, has far less action on the heart.

Chloramide is thought to be decomposed in the blood into chloral and formamide, as large amounts of uro-chloralic acid were found in the urine of a dog which had taken 180 grains of chloramide. The slight action of the drug upon the circulation is explained upon two grounds: that the chloramide is decomposed in the blood so slowly that only a small quantity of chloral is active at any given moment, and that the formamide, in common

with all other members of the NH_2 group, is a stimulant to the vaso-motor centre in the medulla, and thus acts to raise the blood-pressure. Dr. Kny finds that patients prefer chloramide to sulphonal, which is much slower in its action, though in special cases sulphonal may possibly be found more suitable than chloramide.—*Therapeutische Monatshefte*, August, 1889.

After using chloramide as a hypnotic in sixteen cases, DR. LETTOW is of the opinion that we have in this drug a useful, though not always certain, hypnotic. It has no action on the pulse, respiration, or temperature, and is to be preferred to some others of its class; the unpleasant accompaniments are slight headache and dizziness, but these symptoms do not often occur. It is best given one to one and a half hours before retiring, and in an enema.—*Wiener medizinische Presse*, No. 38, 1889.

CHIMAPHILA UMBELLATA AS A DIURETIC.

ABET, an interne of Cochin Hospital, has been experimenting with this old diuretic herb in that hospital. He has tried the decoction, the infusion, the tincture, and other fluid preparations; lastly, the soft hydro-alcoholic extract, only to recognize the superiority of the latter over all other preparations. The hydro-alcoholic extract is made thus: Ten ounces of pipsissewa leaves are exhausted with alcohol at 90° , and a soft alcoholic extract is got by evaporation and concentration. The leaves that had been acted upon by the alcohol are now steeped for two hours in two quarts of water; the whole is then cooled and filtered. To this filtered liquid is now added the alcoholic extract, and after all the soluble parts are extracted the whole is again filtered, and the filtrate is evaporated in a sea-bath down to the consistence of a soft extract. Ten ounces of the powdered leaves yield about three ounces of extract. This extract is given in doses amounting to from two to four drachms a day.

The formula in which the drug may be given is as follows:

Soft hydro-alcoholic extract of chimaphila	3ijss to 3iv.
Syrup of orange	3j.
Rum	3ijss.
Water	3iij.

Of this preparation, a tablespoonful is given every two hours.

Experiments on animals proved that the chimaphila was not poisonous in any dose. Abet himself ingested an ounce and a half of the soft extract without experiencing any bad results. Eleven patients in the hospital were treated by this diuretic preparation. All were cardiac patients with œdema and dyspnœa, who were passing very little urine. The medicine worked well in all these cases but one; this patient was influenced by no diuretic but digitalis. The diuresis in some of these patients amounted to five quarts of urine in twenty-four hours. They took daily in potion for a month and a half from two and a half to three and three-quarters drachms of the extract. The diuresis in all cases began with the second day, and remained at this maximum till there was complete disappearance of the œdema, when the quantity of urine fell to normal.

The chimaphila seemed to have no special action on the heart.—*Boston Medical and Surgical Journal*, October 10, 1889.

EXALGINE.

Exalgine is the name given to a new derivative of the aromatic series, orthomethylacetanilid, discovered by Brignonet, of the Cochin Hospital, and which has suddenly leaped into extraordinary favor as an analgesic in France.

It occurs either in fine acicular or long tablet-like crystals. It is sparingly soluble in cold water, more soluble in hot water, and extremely soluble in very dilute alcohol, or in water slightly alcoholated. Physiologically, it acts very much like analgesine, having, however, more effect upon the sensory and less upon the thermogenetic centres than this substance. Its therapeutic effects are obtained in doses of from four to six grains, administered at once, or from six to twelve grains taken in two doses in the course of twenty-four hours, and are powerfully analgesic, subduing the element of pain in all forms of neuralgia, including visceral.

Like all new remedies of this sort, it is at present on its good behavior, and it is claimed by Drs. DUJARDIN-BEAUMETZ and G. BARDET that it has in their hands, up to the present time, exhibited no evil sequelæ, being free from the rash, cyanosis, etc., so frequently observed after the ingestion of antipyrin and acetanilid.

Exalgine is eliminated by the urine, upon the quantity of which it exercises a marked effect, acting like the antipyretics of the same group, and diminishing the quantity of the secretion. In diabetes it also diminishes the quantity of sugar eliminated. Like all of the derivatives of the aromatic series, it is antiseptic and antithermic, as well as analgesic, and possesses the latter quality in a comparatively superlative degree, being more efficient, in doses less than half as great as antipyrin.

The following are the formulæ for its exhibition, as given by M. G. Bardet in *Les Nouveaux Remèdes*:

Antineuralgic Potion of Exalgine.

R.—Exalgine	3j.
Kirschwasser	3x.
Simple syrup	3j.
Distilled water	q. s. ad 3v.

Dissolve the exalgine in the Kirsch water, and add the syrup and water. The dose is from one to three tablespoonfuls in the course of the day.

R.—Exalgine	3j.
Rum	3x.
Distilled water	q. s. ad 3v.

Proceed as before. The dose is the same as above.—*Medical Record*, October 12, 1889.

ESERIDINE AS A LAXATIVE.

Eseridine in chemical composition closely approaches its congener eserine or physostigmine, into which it may be transformed under the influence of

heat and weak acids. According to the *Journal de Médecine de Paris*, July 14, 1889, in medicinal doses it produces marked diarrhœa, without any appreciable action on the nervous system. Its poisonous dose is six times larger than that of eserine, while it is claimed to act as a reliable laxative in therapeutic doses.—*Therapeutic Gazette*, October, 1889.

CREOLIN.

The composition of this mixture is uncertain, that is to say, the preparation made by one manufacturer is not the same as that produced by another, consequently the value of creolin as an antiseptic may vary within wide limits.

The chief constituents of the strongest make of creolin, Pearson's, are resin soap, creolin oil (hydrocarbons), pyridines, and phenols. Of these the phenols are the important antiseptic agents, and they consist for the most part of creosols.

Solutions of creolin were found to be much more active disinfectants than carbolic acid; it seems probable that phenols, indifferent aromatic hydrocarbons, and resin soap are the constituents which lend to creolin its antiseptic qualities; and further, the condition of a fine emulsion, in which creolin is used, probably contributes to its activity.—*Centralblatt für Gynäkologie*, September, 1889.

CARBOLIC ACID FOR FURUNCLES.

STAFF-SURGEON LEU, of the German army, gives the following conclusions on the treatment of furuncles, in the *Deutsche militärärztliche Zeitschrift*:

Subcutaneous injection of dilute carbolic acid is a simple and effectual abortive treatment of furuncles. Incipient furuncles which have not yet suppurated are especially adapted to the treatment. A cure results in these cases without necrosis of the connective tissue; in the more advanced furuncles which have formed pus, or are even discharging it, no deforming cicatrization follows. The proper strength of the carbolic acid is three per cent. This mode of treatment is particularly valuable in the army, because it shortens the time on the sick-list (when it is necessary to put the man on at all), and he returns to duty with a better cicatrix, while many may be treated without going to the hospital. The simplicity of the apparatus required—a subcutaneous syringe and a small bottle of carbolic solution—makes it possible to carry out the treatment anywhere and at any time; for example, during manœuvres and on the march.—*Lancet*, August 17, 1889.

ANTISEPTIC ACTION OF CHLOROFORM AND OTHER VAPORS.

DR. SEGALL has published in the *Münchener medicinische Wochenschrift*, an account of some observations in which he has been engaged, with the object of determining the amount of antiseptic action possessed by the vapor of chloroform, of formaldehyd, and of creolin. The method employed was to infect the jelly (previously liquefied) in a test tube with the particular microbe under inspection. After the infected jelly had been allowed to solidify, a small tube containing chloroform, creolin, or a ten per cent. solution of formaldehyd was suspended over it, so that the surface of the jelly should

be exposed to the action of the vapor given off, the mouth of the test-tube being closed with a well-fitting plug of cotton-wool. The greatest effect was produced by the vapor of chloroform, this being found to have a nearly equal effect on all the different bacteria experimented on, these including staphylococcus pyogenes aureus, bacillus prodigiosus, and the bacilli of pneumonia, of typhoid fever, of anthrax, of cholera, etc. The upper part of the jelly remained clear and free from microbes, while the deeper layers presented evidences of the existence of numbers of colonies. In the tubes containing formaldehyd, though only in a ten per cent. solution, there was also a great difference between the superficial and deep layers; while when creolin was employed this difference was much less marked, though the antiseptic action was greater than that of the fumes of carbolic acid, which have been shown to exert no preventive action on jelly cultures of the cholera microbe.—*Lancet*, September 28, 1889.

LEMON-JUICE IN NOSEBLEED.

In a case of rebellious epistaxis, which had resisted various modes of treatment, including plugging of the anterior nares, Dr. Fauchon gave relief by the local application of lemon-juice. An injection of the juice was made by a glass syringe into the nostril from which the blood was escaping, with the result of immediately arresting the hemorrhage.—*Medical Record*, October 5, 1889.

A SIMPLE REMEDY FOR HICCOUGH.

After trying all the ordinary measures without avail, DR. LOEBL fell back upon a household remedy as a last resort, and ordered a teaspoonful of pulverized sugar wet with an equal volume of wine vinegar, to be taken at one dose. The hiccough stopped immediately and did not return for six hours, and then ceased after a second dose of the remedy.—*Medical Record*, Sept. 28, 1889.

DISINFECTANTS FOR INTESTINAL DISCHARGES.

PROFESSOR UFFELMANN has carefully tested the disinfectants which are commonly recommended for the purpose of disinfecting fecal discharges as to their reliability to accomplish this object. His results vary to some extent from the generally accepted views on this subject, though he insists upon the importance of contact with the disinfectant for a considerable time. We can hardly hope to find even the strongest agent capable of exerting its preventive qualities within a few minutes.

Professor Uffelmann's observations are limited to intestinal excretions which are in a liquid state, and do not extend to the proper treatment of discharges which have a firm consistence. He considers sulphuric or hydrochloric acid diluted with an equal or with double the volume of water, the most active. Next come an acidified corrosive sublimate solution and also potash lye. Carbolic acid in five per cent. solution does not destroy all bacilli after an hour, but kills nearly all spores after twenty-four hours' contact. Caustic lime in the proportion of 1 to 100 is uncertain in its action; in the proportion of 2.5 to 100, after twenty-four hours, it is quite reliable as a disinfectant.

In order to disinfect watery discharges and those which have a thin consistence, they may be mixed with an equal volume of the diluted acid solution; if sulphuric acid is employed two hours' contact will suffice, with hydrochloric acid twelve hours.

If a five per cent. carbolic acid solution is used, it should be allowed to act for twenty-four hours.

A solution made up of

Corrosive sublimate	.	.	.	.	.	.	2 parts.
Hydrochloric acid	.	.	.	.	.	.	$\frac{1}{2}$ part.
Water	.	.	.	.	.	.	1000 parts.

may be used with an equal volume of feces and allowed to exert its action for at least half an hour—better for twenty-four hours; after a quarter of an hour even typhoid bacilli are not killed.

Caustic lime in the proportion of $2\frac{1}{2}$ parts to 100 parts of feces will act as a germicide in twenty-four hours. Simply pouring hot water over the discharges is useless.—*Therapeutische Monatshefte*, September, 1889.

MEDICINE.

UNDER THE CHARGE OF

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ASSISTED BY

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WALTER MENDELSON, M.D.,

OF NEW YORK.

THE TREATMENT OF TYPHOID FEVER WITH ENEMATA OF A SOLUTION OF TANNIC ACID.

BACKHAUS (*Deut. med. Wochenschr.*, 1889, No. 29, 583) compares our helplessness in the presence of certain internal diseases caused by microorganisms with our ability to master surgical affections by means of direct antiseptic treatment; the difference resting on the fact that the microbes in internal diseases are frequently situated where it is not feasible to use antiseptics. This difficulty does not apply in such full force to affections in which the intestine is the seat of entrance of the microbes into the system, and especially when the disinfection can be applied from the rectum. The author has been led by Cantani's success with injections of a solution of tannic acid in cholera, to attempt the same method in typhoid fever; the indications being to limit the growth of the bacilli, and to render harmless the ptomaines produced by them. The method employed was the injection twice daily of a warmed solution containing at first 30 grains of the acid in two quarts of water, and later

150 grains in the same quantity of water. It is, of course, necessary that the solution penetrate as high as possible into the intestinal canal. To accomplish this the patient should preferably be placed on the back and the fluid injected slowly, with but slight pressure and with frequent interruptions. In this way reflex vomiting will be prevented.

The author reports a series of cases illustrative of the results which he has obtained in many other instances of typhoid fever treated after this method. He claims that the injections of tannic acid have no influence on the fever-curve—*i. e.*, the drug is not a specific in the disease, since it cannot affect the symptoms produced by the bacteria, or the chemical products caused by them after these have once been taken into the system. On the other hand, profuse diarrhœa is entirely checked or greatly limited by this treatment. He believes, too, that the dejections are at once rendered harmless, and the danger of infection to the attendants and patients in the same hospital ward is removed.

IS THE BACILLUS OF TYPHOID FEVER TRANSMISSIBLE TO THE FŒTUS?

EBERTH (*Fortschr. d. Med.*, 1889, No. 5, 161) calls attention to the scantiness of reported investigations on the subject. He quotes the case reported by Reher as well as that published by Neuhauss, in both of which typhoid bacilli were said to be present in the fœtus; and refers, too, to the observation made by Chantemesse and Vidal, who found the bacilli very abundant in the blood from the placenta. He claims, however, that the first two cases fail of the importance which would otherwise be due to them, because no description is given of the characteristics of the microorganisms found; while the third case is in fault, because no observations had been made upon the microbes present in a dead fœtus, and we could not tell but that in it there might occur bacilli resembling morphologically the typhoid bacilli. The confirmation of these cases was, therefore, earnestly to be desired, and this the author has been able to make. There came to his observation not long after its birth a dead fœtus of about five and a half to six month, still surrounded by the membranes. The mother had aborted while suffering from a typical attack of typhoid fever, and the fœtus had probably been dead ten days. Nothing abnormal could be found on dissection, but a careful bacteriological examination was made of the blood and of portions from the different organs of the body. The author describes the methods employed and the appearance of the cultures made; which revealed distinctly the presence of bacilli having all the characters of typhoid bacilli. To prove that these were not microbes accompanying decomposition, and merely resembling those pathognomonic of typhoid fever, he made and describes a series of studies on eight fœtuses, some of them fresh, others having already undergone some change. The results showed that even when the dead fœtus has been retained a long time in the uterus, microbes do not develop in it until late. Further, that in none of the eight cases were other than cocci and diplococci found.

The author considers it proven that typhoid bacilli do pass from the mother to the fœtus, though he does not know whether this is the rule or the exception. He is inclined to the view that it is only as a result of disturbance in the circulation in the placenta that this result becomes possible.

TETANY.

F. C. SHATTUCK (*Boston Med. and Surg. Journal*, 1889, cxxi. p. 231) exhibited at the Boston Society for Medical Improvement a case of tetany occurring in a girl of twenty-one years. Five years previously she had suffered from a very severe attack of diphtheria, followed by paralysis of the fauces and right leg. After recovery she began to experience occasional cramps, at first limited to the right hand and arm, and lasting only one or two minutes, but gradually spreading to the other limbs, lasting sometimes an hour, and becoming more frequent. It was easy to produce a spasm in either or both arms by pressure in the axillary or clavicular regions. Prompt relaxation was effected by the application of the constant current. The only disease with which the affection could in this case be confounded was hysteria, from which it could be distinguished by the intermittent and bilateral features and the total absence of other indications of this affection. In a case which the author saw some years ago, the possibility of tetanus had to be taken into consideration.

S. L. ABBOT (*Ibid.*, p. 230) also reported a severe case of the disease, which yielded promptly to urethan. The disease had commenced without known cause six weeks before, and when first seen the patient was suffering from severe cramps, affecting all the flexors of the extremities, the abdominal muscles in part, the outer muscles of the thighs, and those about the shoulders. They increased in frequency, occurring on some days every half hour, and being easily excited by any muscular effort. There was some pain down the left leg, with tenderness near the sacro-iliac synchondrosis. General sensation was normal, and the special senses were unaffected. Ten grains of urethan were given every two hours during the day, the dose to be increased to fifteen grains at bedtime. A milk diet was also ordered. Within about twenty-four hours the spasms had ceased entirely.

 THE TREATMENT OF INSOMNIA.

JASTROWITZ (*Berl. klin. Wochenschr.*, 1889, No. 27, 624) considers insomnia, for the sake of convenience of study, as an essential disease, for whose treatment there is, therefore, an *indicatio morbi*, an *indicatio causalis*, and an *indicatio symptomatrica*.

Under the first division he discusses briefly the nature of sleep, rejecting the dynamic theory that sleep is a passing into a condition of rest of those parts of the brain which preside over consciousness and voluntary procedures. The mechanical theory rests on the distribution of the blood throughout the body, and, as regards this, it seems likely that the old view, that during sleep there is an anæmia of the brain, is the correct one. The subject is, however, by no means clear, and it is not certainly known whether the sleep produces the cerebral anæmia or *vice versa*. The measures often directed to the production of sleep by diverting the blood to the periphery, such as warm baths, etc., sometimes are very useful, sometimes fail altogether. The chemical theory supposes an auto-intoxication by some hypnotic substance produced in the muscle as it grows tired. A similar substance, however, sodium lactate, when ingested does not produce sleep, though it is known that pro-

cedures which form lactic acid or its salts in the organism dispose to sleep also. Such are exercise in the open air or in institutes for the milk or whey treatment.

In considering the *indicatio causalis*, a distinction must be made between those causes which act directly on the brain, preventing sleep, and those acting indirectly. In the first class are diseases of the brain, as well as excessive mental work and excitement of the emotions. In focal cerebral lesions surgical interference is sometimes of value in curing the sleeplessness; in all others symptomatic treatment is also to be employed, since the removal of the cause, as in overwork of the brain, is not followed by relief of the insomnia. It is not so much the work itself, as its union with a certain amount of emotion, which produces insomnia. Even long-continued emotion, passive, as care, or active, as fear, revenge, etc., without excessive mental work may produce insomnia; and in the treatment of it it is necessary to remove the patient from his surroundings by travel, and to aid the cure by wine, bromide of potash, and paraldehyde. When insomnia is due to the combination of emotion with overwork, the treatment is far more difficult. These patients must for months or years be withheld from work, and, if possible, at first be confined to the house. The Weir-Mitchell cure, electricity, and, in many cases, phenacetin, are of value. So also is a cold-water cure in the mountains.

Among indirect cases of sleeplessness may be included conditions which produce somewhere in the body pain or disturbances of circulation, diseases of the blood, and the entrance into it of substances foreign to it. The *indicatio causalis* in these cases is to remove such causes as working late at night, the use of coffee, tea, tobacco, etc., and intoxication with arsenic, lead, and mercury. Indirect insomnia is often found in general diseases. Here the diminution of the bodily temperature is often of value, or, in diseases of the circulatory apparatus, the use of means which will regulate it. In the insomnia of chronic disease many causes operate. Thus, in diabetes, the hunger, thirst, and the desire to urinate, interfere with sleep. In diseases of the kidneys, insomnia is often the first indication of interstitial nephritis and of uræmia. But in all these chronic diseases the *indicatio causalis* often cannot be filled.

Symptomatic treatment must, indeed, be employed in all cases; and narcotics and sedatives have been principally used. In the choice of these, the drug, the disease, and the individual are to be considered, as well as whether the insomnia is acute or chronic. If acute, the remedy must be prompt and harmless; but if chronic, quickness of action is not so important. A harmless drug is one which is not dangerous in small doses, does not irritate the digestive tract, produce congestion of inner organs, or diminish the strength of the heart. In chronic insomnia its continued administration should not in any way injure the organism. It is, indeed, best to avoid narcotics as far as possible. Since the need of sleep varies greatly with different patients, and the hours in which sleep is the soundest and most beneficial are not alike throughout the night, it is evident that these and other circumstances must influence the choice of the remedy and the time of its administration. As sleep must be obtained in the most natural way possible, the belief must be aroused in the patient that he must go to sleep, the muscles must be relaxed by proper position, and the room should be darkened. A proper external

temperature is important, the best being 10° to 14° R. A local sensation of cold, as in the case of cold feet, is a great interference with sleep; though keeping the head cool is an advantage. The sense of hearing may often be made of value for producing sleep; a soft, monotonous sound being useful for this purpose. The action of hypnotism is not to be undervalued.

Among the drugs used for the treatment of insomnia, the first to be mentioned is alcohol in its different forms. In the severer varieties of chronic insomnia, and especially in those persons disposed to alcoholism, it is best to avoid it, but in the lighter forms it is often very useful. Opium and morphia are excellent hypnotics, and produce sleep most like the refreshing natural sleep. Caution must be exercised in conditions of congestion and in weakness of the heart. The formation of the opium-habit must also be guarded against. In children bromide of potash is to be preferred. Hydrate of chloral is the strongest hypnotic, but is dangerous in large doses. It is excellent in delirium tremens, status epilepticus, and in convulsive disorders. It is, however, to be avoided in heart disease, hysteria, cases in which there is difficulty in breathing, and in those persons in whom it produces no initial stage of excitement, and especially no alteration of the pupil. Paraldehyde in long-continued or large doses gives rise to a condition resembling that produced by alcohol. It is of value in hysteria, alcoholism, acute insomnia, the itching of jaundice, etc. As it is eliminated by and irritates the lungs, it is contraindicated in bronchial conditions. Its action is good in cardiac asthma; bad in emphysema and in arterio-sclerosis. It is not to be used in chronic insomnia and in conditions of extreme excitement, but is of value in insomnia from moral causes and in the restlessness of epileptics. Amylene hydrate disagrees with the stomachs of many patients and produces slight swelling of the hands and face. It is given in the insomnia of all diseases; also to allay cough. Sulphonal acts slowly, and is consequently not of service in acute disease and to allay pain; but of value in conditions with motor unrest. After prolonged use it produces dizziness and a sensation of ataxia.

In comparing the pure narcotic strength of these drugs they may be arranged in the following descending scale: Morphia, chloral, amylene hydrate, paraldehyde, sulphonal. If, however, they are arranged in the order of the proper hypnotic and uninjurious dose they stand: Chloral, sulphonal, amylene hydrate, paraldehyde, morphia.

A DISTENDING SOUND FOR THE TREATMENT OF STENOSIS OF THE (ESOPHAGUS.

SENATOR (*Therap. Monatsh.*, 1889, No. 7) recommends a distensile sound for contractions of the œsophagus. It should be made of laminaria or tupelo, and should be only as long as the constricted portion of the canal. This apparatus should be made fast by a screw to a thin soft sound, and a silk thread can be fastened to its upper end, and allowed to hang out of the mouth after the introduction of the sound. The great advantage of this apparatus is, that a sound may be introduced of a calibre sufficient to allow it to pass easily, safely, and comfortably, and that dilatation only slowly takes place after the desired spot is reached. The instrument should be withdrawn after, at most, a half hour, or difficulties may arise through irritation of the œsophageal walls.

The writer has only tried this method on cases of carcinomatous stricture, but found that by it he was able to make swallowing easier than by the use of the olive-tipped and other bougies generally employed.

PNEUMOTHORAX CONSECUTIVE TO IDIOPATHIC EMPHYSEMA.

E. S. REYNOLDS (*Manchester Med. Chronicle*, October, 1889) details the case of a man who had suffered repeatedly from attacks of bronchitis occurring in winter-time. The last attack had lasted about five months, when the patient was suddenly seized with a severe pain in the left side, made worse by breathing, and accompanied by urgent dyspnœa and collapse.

When admitted to the hospital he was suffering from great difficulty in respiration, subnormal temperature, marked cyanosis of the whole body, and considerable œdema of the hands and feet. The cardiac dulness was absent to the left of the sternum, and somewhat increased to the right of it. There was constant cough, with abundant muco-purulent expectoration. The chest was typically barrel-shaped, with the lower ribs much expanded. The respiratory movements were much greater on the right side of the chest, and this side was two inches less in circumference than the left. The left hypochondrium was distinctly more prominent than the right. Percussion over the left side was hyper-resonant and tympanitic; there was a slight movable area of dulness; vocal fremitus was very feeble; the breath sounds were very faint, and not amphoric; there was no bell-sound. The diagnosis was made of chronic bronchitis, emphysema with dilated heart, and pneumothorax with a small amount of pleuritic effusion on the left side.

The autopsy confirmed the diagnosis. The lung was very emphysematous, but no opening was found from it into the pleural cavity, though this was not thoroughly tested.

The author calls attention to the rarity of pneumothorax consecutive to emphysema, Saussier having reported only 5 in the 131 cases of pneumothorax which he analyzed. He believes, too, that this case controverts the statement of Fernet, *i. e.*, that the pressure of the air in pneumothorax can never be greater than that of the atmosphere, nor distend the side to a greater degree than would happen in forced inspiration, nor displace the organs in the mediastinum. He thinks this is obviously an error, since, in the case which he reports, the diaphragm was markedly depressed on the affected side, the mediastinal organs were pushed to the opposite side, and, finally, when an incision was made through the chest-wall, the air was distinctly blown out of the opening.

MOVABLE HEART.

ALOIS PICK (*Wien. klin. Wochenschrift*, 1889, No. 40), after a review of this subject and a report of certain cases, draws the following conclusions:

1. Slight movability of the heart is of common occurrence, while great movability of the organ is comparatively rare.

2. The abnormally movable heart is found in strong and healthy individuals, and is then probably a congenital anomaly. It is also found in combination with heart disease, as well as in disease of other organs, without

there being any discoverable genetic relation between these pathological processes and the abnormal mobility.

3. The condition of abnormal movability can be brought about by emaciation, whether this be due to disease or to treatment for obesity.

4. The diagnosis can be made with certainty on account of the shifting position of the apex beat and of the area of cardiac percussion dulness, seen as a result of change in the position of the patient.

5. Regarding the subjective symptoms of abnormal mobility of the heart, sometimes there are absolutely none, but in the large majority of cases there are occasional palpitation, a sense of weakness and vertigo on running or violent exercise, and an inability to lie on the left—or more rarely the right—side, owing to the sense of oppression produced thereby.

ON THE FUNCTION OF THE STOMACH IN DISEASES OF THE HEART.

E. HUEFLER (*Münch. med. Wochenschrift*, 1889, xxxvi., No. 33, 561) says that of the various affections in which the stomach is secondarily disordered, tuberculosis is the only one in which sufficiently careful and extended investigations have been carried on. These studies, made by different observers, show that the disturbances of function in this affection vary considerably; depending on the stage of the disease, and other conditions. In general, there is a chronic gastritis of varying intensity, which one writer (Immermann) claims is purely accidental, and has nothing to do with the principal disease.

A second group of disorders, in which Ewald says there is a chronic catarrh, is that of the diseases of the heart. As it is such a common occurrence for patients with cardiac affections to complain chiefly, or even exclusively, of gastric symptoms, the author has endeavored, in a series of cases, to examine the actual condition of the gastric function, as far as the state of the patients permitted. With this end in view, he administered the meal proposed by Leube, usually at about 9 o'clock, and on an empty stomach. The meal consisted of 8 ounces of roasted and chopped beef, 1 ounce of bread, and not more than 1 glass of water. In two hours the effort was made to press out some of the contents of the stomach through the sound, and without the addition of water. This was always successful. The remainder was left to undergo digestion, and a sample of it was removed after this had been going on six hours; the stomach being after this entirely washed out. Where the condition of the patient permitted it, these examinations were frequently repeated. In other cases only the two examinations were made in all, and sometimes these conducted on different days.

The material which had been removed was filtered and its reaction tested with litmus paper. The presence of hydrochloric acid was then tested with phloroglucin-vanillin; and that of lactic acid by Uffelmann's test. It was not found necessary to determine the degree of acidity.

Methyl-violet was also employed in the examination for hydrochloric acid, but the author considers it by no means so reliable as Günzburg's reagent. Where the quantity of the gastric juice obtained permitted it, the digestive strength was tested in a warming-oven at 98.6° F.; and sometimes the examination for syntonin and propeptone was carried out.

The author gives the details of the individual cases—10 in all—and remarks on the fact that, except in one instance, free hydrochloric acid was never found in the gastric contents in heart disease. In this case, there was free acid present after six hours; at a time when hydrochloric acid should have disappeared from the normal stomach. The case was, therefore, one of hyperacidity, which the alkalinizing action of the heart disease had not been able to neutralize. The author believes that, as a result of passive congestion in the circulation in the stomach, either there is an effusion of alkaline serum, mixing with the acid, or else the simple retardation of the blood current is answerable for the diminution of hydrochloric acid. The disturbance of the secretion is evidently very easily effected, since the majority of the patients examined had no subjective symptoms of gastric disorder. Mild cases of heart disease do not necessarily produce a gastric catarrh, but simply a diminished secretion; and the lack of fine division of the food, which is the result of this, is overcome by the powerful muscular action of the stomach. It is advisable, therefore, to administer hydrochloric acid to patients with heart disease in order to favor this minute division of the food, and to relieve the gastric muscles of the necessity of pressing large portions through the pylorus. In this way, the development of an actual catarrh may, perhaps, be prevented.

THE INFLUENCE OF DRUGS ON PUTREFACTIVE PROCESSES IN THE INTESTINE.

R. STIEFF (*Zeitschr. f. klin. Med.*, xvi. 311, 1889) reviews the experiments and writings of those who have shown that such substances as phenol, indol, skatol, and kreosol, found in the urine, are really products, in the healthy individual, of decomposition going on in the intestine under the action of the microorganisms of putrefaction. In individuals in whom there is some putrefactive process taking place elsewhere in the body, owing to some pathological condition, these substances will appear in the urine in excess. There will also be a similar increase when the absorption from the intestine of the normal products of digestion is insufficient or interrupted.

He next discusses the experiments which have been made to determine whether the introduction of antiseptic materials into the intestine would not interfere with the decomposition of albuminous bodies there. As he does not regard the results of these experiments as conclusive, and as it is important to possess some substance which has this power of checking putrefaction in the bowel, he himself undertook some investigations on the subject, performed on a series of patients in Gerhard's clinic. The drugs employed were calomel and camphor, and careful analyses were made of the urine while they were being given. The experiments he details fully, and sums up the results in the following conclusions:

1. Calomel, given in doses of 5 grains three times a day, exhibited no disinfecting power in conditions of increased decomposition in the intestine.
2. Consequently it can scarcely be recommended for the purpose of checking putrefaction in the intestine, on account of the large dose which would need to be employed.
3. Camphor appears to possess a slight restraining power on putrefaction,

since, in two cases, doses of 5 grains three times a day produced a diminution of the intestinal decomposition.

4. This action of camphor does not appear at once, and is only distinct after two to three days.

A CASE OF PERFORATION OF A PERITYPHLITIC ABSCESS INTO THE PLEURAL CAVITY; WITH PURULENT, FECULENT PLEURAL EXUDATE.

E. GRAWITZ (*Berl. klin. Wochenschr.*, August 12, 1889) reports an interesting case of a woman who, for fourteen days before coming under observation, had suffered from vomiting, fever, and pain in the right side. She had at first taken purgative pills for constipation, and later medicine to check the diarrhœa produced by them. When first seen she was in a stupid condition, and made no complaints. The pulse was rapid and small; the respiration accelerated and superficial, and accompanied by slight cough. The tongue was dry and brown, and there were vomiting and diarrhœa. In the course of the disease dulness developed over the posterior part of the right lung, and aspiration revealed a bloody serous effusion. No aspirations were made in the latter part of the patient's life. The abdomen was distended, but not tender on pressure; and in the right ileocæcal region there were an indistinct dulness and a moderate amount of gurgling. Enlargement of the spleen could not be detected. The fever continued very irregular, and the symptoms showed little alteration for nearly three weeks, when death occurred. At first it seemed as if the disease could be typhoid fever, but the clinical diagnosis was finally made of some septic process going on in the abdominal cavity.

The autopsy showed a purulent perityphlitis perforating into the retro-peritoneum, cæcum, duodenum, and through the diaphragm into the right pleural cavity. The vermiform appendix was gangrenous, and contained a fecal concretion which was evidently the starting-point of the abdominal inflammation. The appendix contained also a small perforation into the peritoneal cavity, which had certainly occurred only during the last days of the patient's life, and had produced a recent, circumscribed, purulent peritonitis. The peculiarity of the case lay, of course, in the fact that the pus had perforated into the pleural cavity. The contents of the pleura were purulent, of rather thick consistence, yellow in color, and of very marked fecal odor. It is evident that there must have existed a pleurisy at the time the aspirations were made; but at just what time the pus penetrated the diaphragm cannot be determined.

CYSTINURIA.

LEO (abstracted in *Medical Chronicle*, October, 1889, from *Zeitschr. für klin. Med.*, B. xvi., H. 3 and 4) reports a case of a woman who at the age of nineteen was attacked by violent spasmodic pain in the region of the left kidney. The attacks of colic recurred afterward at intervals of three to six months. The last, especially long and severe, occurred in 1881, and ceased as a stone almost the size of a bean was passed in the urine. For one and a half years she was free from pain, and then began to suffer from periodic seizures of slight, dull pain. Five years ago pain recurred in the region of the right kidney, coming on after violent exertion, and probably due to floating kidney.

While under observation she complained of dizziness, headache, occasional oppression, disordered bowels, and at times slight pain in the region of the left kidney; but the chief causes of complaint were weakness, loss of appetite, and the pain in the right renal region. Examination showed that the right kidney formed a movable tumor in the right hypochondriac region. The sediment from the urine always contained a great number of six-cornered crystals of cystin, mixed with epithelium and lymph-cells. Many times small calculi the size of a pin's head were found in the deposit. The stone passed in 1881 weighed nine grains, and was of a yellowish color and of waxy appearance. It was soluble in ammonia and hydrochloric acid. Fine crystals were obtained by neutralizing the hydrochloric acid solution with ammonium carbonate.

Hitherto sixty-three cases of cystinuria have been described. Probably the affection is more frequent, but only gives rise to symptoms when calculi are formed. This is the reason why most cases described have been in the male sex, as the spontaneous passage of stones takes place less frequently in the male than in the female.

Baumann found in a case of cystinuria with catarrh of the bladder tetra- and penta-methylendiamine in both urine and feces. As these substances are not found in healthy urine, some relation is supposed to exist between them and the occurrence of cystin in the urine. According to Brieger, they are the products of bacteria.

The author then describes Loebisch's method for the quantitative estimation of cystin. Then he details three series of observations which he made on the present case with regard to the amount of cystin, uric acid, nitrogen, etc., in the urine. In the first series the patient followed her ordinary mode of life, and took an ordinary but accurately measured diet. In the second series the influence of hard, muscular exercise was studied. In the third series 6½ ounces of meat peptone were added to the diet. The results were negative, the amount of cystin remaining practically unchanged. Many earlier authorities found a diminution of uric acid, but in the present case, as in many more recent cases, the amount of uric acid in the urine was not lessened.

ANTIPYRIN IN DIABETES INSIPIDUS.

OPITZ (*Deut. med. Wochenschr.*, No. 32, 1889, quoted in *Centralblatt für die gesammte Therapie*, Oct. 1889) administered antipyrin to three cases of diabetes insipidus in which long-continued treatment of other kinds had been valueless. The results were immediate, and all the symptoms at once disappeared. In one case the cure was permanent and in another very lasting after the withdrawal of the medicine. In the third case the amount of urine reached again its former figure, to diminish again when the administration of antipyrin was recommenced. Two of the cases were very severe, one of them having lasted twenty years, and the other excreting sixteen quarts daily. The initial dose of the drug should be 30 grains daily, and this should be increased 15 grains each day until 90 grains are being given, or the diminution of the secretion of urine appears. After about eight days the medicine should be omitted, in order to observe whether the good effects remain.

The author believes that even should further trial of antipyrin show that

it does not always succeed in diabetes insipidus, yet for many cases the prognosis will be certainly made better by the use of the drug.

PRIMARY MALIGNANT DISEASE OF THE DUODENUM.

E. N. WHITTIER (*Boston Med. and Surgical Journal*, 1889, cxxi. 377) refers to the unsatisfactory condition of the few published statistics regarding the relative frequency of different forms of intestinal cancer, and concludes that computation from all sources would give about one per cent. of intestinal cancer primary in the duodenum. It is generally conceded that the most prominent factor associated with morbid growths of the bowel is diminution of the lumen of the tube, whatever the nature of the growth may be. A certain class of intestinal neoplasms arise as disks, fungoid growths, or villous prolongations; and many other forms at some time assume this type of development; and all such project into and obstruct the canal. Another class of growths implicate the circumference of the intestine and produce annular constrictions. Whichever of these two methods operates, the tendency is the same—toward a complete closure of the canal. The fact that the contents of the stomach leave it in a liquid state, renders it possible for a passage to be effected through a very small opening. Hence the extremely negative symptom of latency stands high among the rational signs of cancer of the duodenum. There is no factor in this locality to produce compensatory hypertrophy of the muscular coat of the bowel as in lower parts of the intestine. Consequently the symptoms of lessened calibre, long latent, suddenly declare themselves with great force, and with all the evidences of an acute and complete stenosis.

In cancer of the duodenum the symptoms worthy of the greatest confidence are those arising from occlusion of the common duct, with or without evidence of obturation of the intestine, and the resulting dilatation of the stomach and first portion of the duodenum; for it is at this point that the greatest number of duodenal cancers occur. When the disease affects the upper third, intestinal digestion is less disturbed, because the passage of the bile and pancreatic secretion is not interfered with. In this locality, however, the growth can only with the greatest difficulty be differentiated from pyloric cancer. When the cancer is in the lower third of the duodenum, bile is frequently present in the vomited matter. Blood may appear either in the dejecta or vomited matter, according as the gut is pervious or the ulcerative process is at the lower or upper portion of the obturating mass.

The appearance of the abdomen in duodenal cancer is determined, in large measure, by the quantity and quality of the food descending into the intestine. As a rule, it is "boat-shaped;" and this, together with gastrectasis, serves to indicate the degree of obstruction. Pain is a very uncertain symptom, and its aid to diagnosis is small. The question of tumor is particularly unsatisfactory; for though a tumor can usually be detected in other forms of intestinal cancer, this is not the case when the growth is in the duodenum. In this locality a tumor cannot be discovered in any considerable percentage of the cases.

The author appends a synopsis of thirteen cases of duodenal cancer not pre-

viously presented in connection with a paper on this topic. In the majority of these there is no record of the presence of any tumor.

ON PECULIAR PARASITIC ORGANISMS IN THE EPITHELIAL CELLS OF CARCINOMA.

THOMA (*Fortschr. d. Med.*, June, 1889) says that for some time he has been studying peculiar, small, cell-like structures, which occur very frequently in the epithelial nuclei of carcinoma. They exhibit such a contrast in form, size, and arrangement to the cell-forms usually found in man, that they must be considered to be of a parasitic nature. These parasites appear as single bodies of from 4 to 15 μ in diameter, becoming more apparent when stained by various dyes, as safranin, alum carmine, hæmatoxylin, and eosin. They consist of protoplasm and nucleus, and sometimes of a nucleolus as well. Their form is irregularly round, or oftener oval; or sometimes whetstone-shaped, or of the form of a ship (resembling *navicella*). They are quite strongly refractive. It is a remarkable fact that these bodies lie singly or in groups of five or six in the epithelial nuclei. These latter then lose their ability to take the stain, and become hollow, bladder-shaped bodies, containing only the parasites and here and there a little granular matter. In other cases, however, a cavity forms close to the cell-nucleus, and in this the unit cellular bodies are situated.

In the hollows in the cell-nucleus are also found spheres of chromatin, and sometimes granular or homogeneous, highly refractive, spherical bodies, unstained by nuclear dyes.

The author intends in the future to give a more extended description of these peculiar forms, which he has found in carcinoma of the rectum, stomach, and breast. He would, in concluding, only call attention to the fact that similar parasites have appeared to produce epithelial-growths in birds, and that in the intestinal epithelium of the salamander have been discovered parasites likewise allied to the coccidia.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE UNIVERSITY, PHILADELPHIA, AND GERMAN HOSPITALS.

DRY OPERATIONS.

DR. LANDERER (*Archiv für klinische Chirurgie*, vol. xxxix., 1889) says that now that the great problems of antiseptics have been solved, it remains chiefly to improve in smaller matters our treatment of wounds, and to endeavor not only to cure all patients, but to do so *tuto, cito et jucunde*. Influenced by the

fear of carbolic, iodoform, and sublimate poisoning in antiseptics, and by the difficulties of procuring sterilized fluids, etc., in asepsis, he has for a long time operated without bringing a drop of fluid of any kind in contact with the wound. The instruments are boiled and kept in a weak carbolic solution. The hands and the field of operation are disinfected by a modification of Fürbringer's method. As the wound is made it is dried with pieces of sublimate gauze and filled with wads of the same material. The larger vessels are tied. Angles and pockets of the wound are united by buried stitches. The wound is entirely closed, no provision for drainage and no opening for that purpose being left. The dressings are applied with moderate pressure. The results of the method, according to his experience in ninety major operations of all sorts, are:

1. All wetting and cooling of the patient are avoided.
2. The loss of blood is reduced to the minimum.
3. There is little or no danger of intoxication from absorption of the antiseptics.
4. The operation is shortened, as there is so much less time spent in arresting hemorrhage.
5. Healing is quicker and safer.
6. The antiseptic details are easier and more manageable.
7. The hands of the operator are not affected by contact with powerful antiseptics.

SUBCUTANEOUS MERCURIAL INJECTIONS IN SYPHILIS.

PROFESSOR LELOIR and M. A. TAVERNIER record (*Journal des Maladies Cutanées et Syphilitiques*, August and September, 1889) the results of their experience with hypodermatic injection of, *a*, calomel and oil of vaseline, 1 to 12 (875 injections); *b*, yellow oxide and oil of vaseline, 1 to 12 (642 injections), and "gray oil," purified mercury, 4 parts, ethereal tincture of benzoin, 1 part, oil of vaseline, 8 parts (56 injections). The retro-trochanteric region was used; one-half of a syringe (Pravaz) was used for the first two, one-third for the last formula. The intervals were eight or nine days. They note the following complications observed in the series of 1573 injections: *a*, local pains, sometimes radiating, preventing movement, lasting from one to nine days; *b*, paresis of the lower limbs; *c*, vertigo, headache; *d*, occurrence of buccal mucous patches four or five days after the injection; *e*, local mercurial irritation around the point of injection; *f*, mercurial stomatitis; *g*, diarrhoea, simple or bloody; *h*, cutaneous swellings, hard, or sometimes vesicular, not going on to suppuration.

As to the value of these injections they come to these conclusions: 1. The treatment of syphilis by subcutaneous injections should be reserved for the erythematous eruptions and consecutive syphilides of the tegumentary surface. 2. The method should be employed when it is desired to make these eruptions disappear with extreme rapidity. 3. It is especially applicable to hospital patients—*i. e.*, to those who can be kept in bed. 4. It has but a slight action on the syphilides of mucous surfaces. 5. It has no influence in preventing early relapses. 6. In many cases it fails when inunctions suc-

ceed. 7. It should not be employed in cerebral, spinal, or visceral syphilis, nor in the syphilis of pregnant women, nor in infantile syphilis.

Its only advantage appears to be its rapidity of action.

SHOULD SYPHILITIC PHYSICIANS CONTINUE THEIR PROFESSIONAL WORK?

PROFESSOR A. NEISSER, of Breslau, discusses (*Centralblatt für Chirurgie*, September 28, 1889) the above subject at some length, especially in reference to surgeons and obstetricians. He believes that the answer depends upon a number of factors:

1. The age or stage of the syphilis. The younger the disease, the greater the power of transmission. There is no proof of the existence of any infective quality during the late or tertiary stage.

2. Upon the character of the treatment, which, if careful and continuous, reduces both the chances of infection during the early period, and at the same time shortens that period materially.

3. As to details, the existence of a syphilide on the hand is an imperative contra-indication to professional activity, unless it is possible, in some safe mechanical way, absolutely to isolate the diseased region.

4. Infection by blood through accidental wounds or abrasion of the fingers of the operator is, of course, possible, but it is highly improbable that this will occur through microscopic cracks or solutions of continuity, and it is very unlikely to happen after the first year of the disease.

5. Infection through non-specific skin troubles in the hands of the syphilitic may occur, as from pustules, eczema, fissures, etc.

6. As to all these matters Professor Neisser draws a sharp line between possibility and probability, and is strongly inclined to think that with care as to the fingers, the use of protectives and of disinfectants, etc., the medical man who has been so unfortunate as to contract syphilis may continue to practise his profession with safety to his patients. This conclusion applies with more force to the surgeon than to the obstetrician, whose patients are in greater danger.

A CASE OF LORETA'S OPERATION.

DR. T. W. HUNTINGTON (*The Occidental Medical Times*, September, 1889) reports the case of a man, æt. twenty-three, who, after a long-continued history of gastric ulcer, developed the symptoms of pyloric stenosis. The stomach was opened, the pylorus found and dilated, first with a small uterine dilator, then with a Bigelow's sinus dilator, and finally with the fingers. He recovered uninterruptedly, and two months later was eating solid food without vomiting or distress.

As to the indications for operation in this class of cases, it would seem that positiveness in the diagnosis of cicatricial or non-malignant stenosis of the pylorus is far from easy of attainment. There are, however, three factors, which, if present simultaneously, point strongly to the existence of this condition: First, a well-authenticated history of chronic gastric or duodenal ulcer; second, persistent vomiting of partly digested food, or of biliary fluid; third, marked dilatation of the stomach. Epigastric pain, disgust for food of

any sort, and chronic constipation, together with various phenomena depending upon functional derangement, are of value only as confirmatory symptoms.

According to Treves, of London, this operation has been done frequently on the continent of Europe, Loreta being the most prominent operator. Up to May, 1889, this method had been resorted to but once in England, and that case was treated by Treves himself. Drs. Kinnicut and Bull, of New York, have recently published a table of twenty cases by various operators. To this table are added Treves's case and this of Dr. Huntington, making twenty-two in all. Of these, fourteen are reported cured, one improved, and seven dead. The causes of death in the fatal cases were as follows: Cancer of the stomach, hemorrhage into the stomach after operation, renal disease, exhaustion (on the eighteenth day), tetanus, and collapse. In one case the cause of death is not given.

LAPAROTOMY IN CHRONIC PERITONITIS.

L. PROCHOWNICK (*Deutsche medizinische Wochenschrift*, No. 24, 1889) is of the opinion that much of the success claimed for operative interference in tubercular peritonitis is attributable to errors of diagnosis, and that the same also applies to other peritoneal inflammations. Four cases out of nine upon which he has recently operated were examples of chronic peritonitis, and had their origin in the pelvic tissues. No signs of uterine, tubal, or ovarian disease were present, and gonorrhœal infection could be excluded. The cases were all characterized by adhesions of the omentum to the pelvic organs. These omental adhesions occur in many cases of acute pelvic peritonitis, and gave rise to intestinal and gastric symptoms by interfering with the free movements of the omentum.

These symptoms consist of nausea, vomiting, gastralgia, flatulence, abdominal distention, and, if the omentum is adherent to the pelvic viscera, rectal and vesical tenesmus, constipation alternating with diarrhœa. Adhesion of the omentum to the generative organs gives only few symptoms, nausea and pain in the stomach after exertion, menstruation attended with cardialgia, pains radiating from the umbilicus to the labia.

If this symptomatology be well studied, the diagnosis of omental adhesion is as readily made as that of tubal or ovarian trouble.

Adhesion of the omentum to the parietal peritoneum is usually present, but gives no symptoms unless there be a complicating hernia.

The writer concludes that in chronic peritonitis, especially where extensive omental adhesions exist, and other measures have proved unavoidable, laparotomy is indicated. But the operator should be content with removing the peritoneal lesions, and leave the uterus and its appendages, unless they be markedly diseased.

The importance of chronic peritonitis in producing many of the symptoms in cases subjected to castration, has not been as yet recognized. Schroeder and Martin have successfully employed conservative treatment, and the latter regards the accompanying chronic peritonitis as the causative factor in the majority of cases of chronic oöphoritis and disease of the tubes. Other observers have also called attention to the frequency with which chronic peritoneal and omental adhesions are found in secondary laparotomies, and to their importance in the symptomatology of the case.

This shows that we should distinguish the symptoms attributable to chronic peritonitis from those due to disease of the other organs, and try to prevent at the first operation the development of subsequent peritoneal trouble (adhesions). This can be accomplished by loosening adhesions, avoiding strong antiseptic and astringent fluids in the abdominal cavity, removal of the con-tused omentum, strict toilet of the peritoneum, and the avoidance of opiates before and after the operation.—*The Annals of Surgery*, October, 1889.

THE USE OF INJECTIONS IN INTUSSUSCEPTION.

DR. W. E. FOREST calls attention (*Medical Record*, October 5, 1889) to the necessity, in using injections of either gas or liquid in cases of intestinal obstruction, of knowing, first, how much force the intestine will stand without danger of rupture; second, how much force one is using at any given moment. His experiments seem to show that the limit of safety in adults is fifteen pounds to the square inch; in children, six to eight pounds to the square inch. With the Bergeon apparatus, the pressure cannot be measured and regulated accurately. With the Davidson syringe, the exact pressure is equally indeterminate, while it is possible to produce a pressure of thirty to seventy pounds to the square inch. Dr. Forest continues as follows:

“In order to measure the pressure used in an injection, it is only necessary to remember that one atmosphere, or fifteen pounds to the square inch, supports a column of water thirty-three feet high; hence a column of water thirty-three feet high must make a pressure of fifteen pounds upon every square inch of surface at the base of the column. Now, if this column of water be held in a rubber tube of ordinary size, after allowing for friction of the water in the tube, it will be accurate enough to say that every two feet of the column represents a pressure of one pound to the square inch; hence a rubber tube six feet long, filled with water, and held vertical, will cause a pressure of three pounds to the square inch at its base; and a tube twelve feet long will exert a pressure of six pounds to the square inch at the base, and so on.

“Now, apply this principle to a case of intussusception in a child, for instance. The surgeon, instead of sending to the nearest city for a consultant and a Bergeon apparatus, goes to the drug store or hardware store and gets a rubber tube twelve to twenty feet in length. Into one end is inserted a funnel; into the other a nozzle of a Davison syringe. In order that the injected fluid may be retained, a shoulder may be made on the nozzle about one inch from the end, by winding a roller-bandage around. This shoulder will retain every drop of the injection when pressed against the sphincter. Now a pitcher of warm salt water completes the apparatus, and the father of the child is the assistant surgeon.

“The patient is taken into the hall-way of the house, so that the requisite elevation may be gained, the child is etherized, the surgeon inserts the nozzle of the syringe, and holds it in the rectum with one hand, while with the other he manipulates the walls of the child’s abdomen. The assistant pours the water into the funnel and slowly raises it, mounting the stairs at the time if necessary. When the funnel has been raised twelve feet above the level of the child’s body, great care should be exercised, as the pressure is now about

six pounds on every square inch of colon below the obstruction. It is seldom that a greater pressure than this will be needed to reduce a recent invagination. The pressure should be increased very slowly, as time is an important element in reducing an invagination. If in any case the pressure mentioned above does not bring about the end aimed at, the pressure may be increased up to ten pounds to the square inch."

THE RADICAL CURE OF HERNIA.

DR. GEORGE R. FOWLER considers at some length (*Brooklyn Medical Journal*, November, 1889) the question of the present aspect of the radical cure of hernia, and comes to the following conclusions:

1. As to the selection of cases in which the radical cure is to be recommended, it may be said that the operation becomes one of necessity in all young persons with hernia, in the lower walks of life where existence depends upon some form of manual labor. Among these there always exists a demand for a snug or tightly fitting retentive apparatus; this alone will in the course of time so alter the anatomical conditions as to render it next to impossible to retain the hernia in position as well as increase the difficulties of a radical cure. Again, the expense and want of time to devote to personal needs prohibit most of this class from keeping themselves supplied with the most approved form of truss, and likewise from keeping the same in repair. Hence, there is always a temptation either to do without entirely, in ignorance of the dangers of such a course, or to place reliance upon an instrument which may be either inefficient or inapplicable for other reasons. On the other hand, among the better class, where ample means exist, and probably always will, to provide the best possible appliances and keep the same in an efficient condition; where the mental calibre of the patient is such as to grasp the situation and appreciate the dangers attending a careless disregard of instructions regarding the use of the truss, the operation may be regarded as one of convenience, and operative measures are to be instituted exactly as in the condition, analogous in this respect, of clubfoot.

If, in either of these classes, at any time it should transpire that the hernia cannot be retained without undue distress, or with ease and certainty, the radical cure, in view of the exceedingly favorable results obtained, is called for.

2. In all cases of strangulated hernia the operator owes it to himself, as well as to the patient, not to allow the latter to leave the operating table until the operation for radical cure has supplemented the necessary herniotomy.

3. The age of the patient need not be taken into account, providing the operative procedure selected be of a character suited to the requirements of the case.

4. With regard to the after-treatment, not less than six weeks in the recumbent position is to be considered essential, and no truss should be worn after the operation.

5. With these requisite conditions fulfilled it is fair to state to the patient, if he be a young person (under twenty-five years), that a cure may be assured; if he be an older person, still the chances are largely in his favor, and including the worst cases the proportion of cures averages at least fifty per cent.

The mortality, if individuals with chronic organic diseases or well-marked cachexia be eliminated, may be said to be next to nothing in proper hands.

AN UNFORTUNATE RESULT OF WHITEHEAD'S OPERATION FOR HEMORRHOIDS.

DR. CHARLES B. KELSEY, under the above heading, reports (*N. Y. Medical Journal*, October 5, 1889) the following case:

A woman, aged thirty-five, was operated upon eight months since in one of our city hospitals for hemorrhoids, by Whitehead's method. On examination, the anus presents a circle of excoriated mucous membrane, ending suddenly in healthy skin. The mucous membrane, which has been drawn outside of the rectum and united to healthy skin, is an inch broad for one-half the circumference of the anus and half an inch broad for the remainder. In other words, the circular incision in the operation was entirely outside of the margin of the anus, and the mucous membrane has been drawn down to it, changing a muco-cutaneous opening into one covered by mucous membrane. The patient's condition is a miserable one.

The plan of treatment advised was to dissect this mucous membrane loose, cut it off, bring the skin up as near the verge of the anus as possible, and allow the wound to heal by granulation. A stricture of the anus would, of course, be the natural consequence, but one which Dr. Kelsey thinks could be managed and would be better than the extensive ulceration which is sure to follow the excoriation now begun.

[In "Whitehead's operation," properly so called, the circular incision should be made at Hilton's "white line"—i. e., at the line of junction of skin and mucous membrane. It does not seem clear that, in this case, the operator followed this direction, which is explicitly given by Mr. Whitehead. If he did not, it is unjust to saddle the method, now on trial before the profession, with a failure not properly belonging to it.—ED.]

LITHOLAPAXY IN CHILDREN.

DR. DUDLEY P. ALLEN (*Journal of the American Medical Association*, Oct. 5, 1889) carefully considers the arguments for and against the crushing operation in children, and comes to the following conclusions: Beyond question, the operation of litholapaxy in children is one which must be recognized. It is particularly suited to medium and small-sized stones, and though median and lateral lithotomy are very successful in such cases, we believe litholapaxy will be equally so in skilled hands, and that, beside safety, it has the great advantage of absence of cutting, and of the filthy condition of the patient. Suffering is commonly very slight, and is confined to a few days, and it is not infrequent for patients to be up and around on the third or fourth day. Patients will not hesitate so long before the crushing as the cutting operation, and should the return of the stone be more frequent after crushing than after cutting—as is shown to be the case—a second operation will be more easily performed than the first, on account of the size of the urethra increasing with the age of the patient. The condition of the boy's bladder is certainly more likely to be favorable to litholapaxy than that of an adult. Our idea would

be that large and hard stones should be removed by the suprapubic operation, especially if for any reason it is desirable to see the interior of the bladder. Medium and small stones are favorable for removal by litholapaxy, unless for some reason the urethra be smaller than normal. The operation of median lithotomy is a favorable one in cases with small stones, but an operator skilled in litholapaxy would do well to choose the latter. In cases of medium-sized stone, with an urethra not sufficiently large for the introduction of proper instruments for crushing, lateral lithotomy is indicated.

THE TREATMENT OF RETENTION OF URINE FROM PROSTATIC ENLARGEMENT.

MR. A. F. MCGILL, of Leeds, in opening the discussion of the above subject at the last meeting of the British Medical Association (*British Medical Journal*, October 19, 1889), advanced the following propositions, supporting them by the histories of twenty-four cases occurring in his own practice and that of others. His remarks apply to the chronic, and not to the acute, form of retention. He asserts:

1. That prostatic enlargements which give rise to urinary symptoms are intravesical, and not rectal. . . . It has been long recognized that the severity of the symptoms in a case of hypertrophy of the prostate bears little or no relation to its apparent size as felt through the rectum, and it is also well known that a considerable number of men, aged fifty-five and upward, have prostates of an abnormally large size, though of these only a certain proportion—say fifty per cent.—suffer from urinary symptoms. This strange difference depends on the position at which the organ is enlarged.

Prostates of immense size, which project toward the rectum and perineum, cause no urinary trouble, while severe symptoms may supervene when the prostate on rectal examination is apparently of normal dimensions.

In the twenty-four tabulated cases there was one characteristic common to all—the enlarged prostate projected into the bladder. There are many varieties of the intra-vesical growth.

We find (a) a projecting middle lobe—pedunculated or sessile; (b) a middle lobe with lateral lobes, forming three distinct projections; (c) the lateral lobes alone; (d) a pedunculated growth springing from a lateral lobe; and (e) “a uniform circular projection surrounding the internal orifice of the urethra.” This last variety, described by Brodie, has in recent years escaped notice; it is better seen *in situ* than in museum specimens, and is not of infrequent occurrence. It surrounds the urethra like a collar, and projects for a variable distance into the bladder.

2. That retention is caused by a valve-like action of the intra-vesical prostate, the urethral orifice being closed more or less completely by the contraction of the bladder on its contents. . . . When the bladder contracts on its contents, the contained fluid is forced on to the projecting prostate, and the urethral orifice is closed. The mechanism is the same—with one exception—whatever may be the variety of the enlargement. Whether there is a middle lobe, or lateral lobe, or a collar, the same valve-action occurs; and the more violent the contraction the more complete is the action of the valve.

3. That in many cases self-catheterism is the only treatment required.

4. That when the catheter treatment fails, or is unavailable, more radical measures are necessary. He admits that he is unable to prove this assertion, but restates his belief that a large proportion of the cases treated by the catheter sooner or later break down—in other words, that eventually the prostatic enlargement is the cause of death.

The breakdown may come soon, or it may come late, but in many cases it ultimately supervenes. The urine becomes thick and ammoniacal; the desire to micturate is continuous; the passage of a catheter relieves but for a few minutes; the suffering and discomfort are constant—day and night; life becomes a burden, and death a happy release. The greatest care cannot prevent this result, and the grossest carelessness does not always induce it.

5. That the treatment, to be effective, should (a) for a time thoroughly drain the bladder, and (b) permanently remove the cause of the obstruction. It is now some ten or twelve years since perineal drainage was introduced for the relief of cystitis in patients suffering from prostatic breakdown. The relief obtained in this way has been most marked, and the practice is well recognized and established. As soon as efficient drainage is effected the bladder ceases to be a receptacle; urine sweet from the kidneys flows through it; putrefactive changes are prevented, and acute symptoms cease. The relief, however, is only temporary.

6. That these two indications (of drainage and permanent removal of obstruction) are best fulfilled by a suprapubic rather than by a urethral or perineal operation. There are three ways in which it is possible to perform a radical operation for the removal of prostatic obstruction—the urethral, the perineal, and the suprapubic. Of these the urethral appears to be in every way unsatisfactory. In comparing the perineal with the suprapubic operation, he prefers the latter for the following reasons:

1. It is more generally applicable.

2. It can be performed with greater precision, and completed with greater certainty.

3. It insures complete and most efficient drainage. It may possibly be argued by some that the position of the suprapubic wound will prevent drainage, and that the urine will naturally escape more readily through a dependent perineal wound than through one above the pubes. Experience shows that this is not so. Drainage takes place more easily through the soft abdominal than through the hard perineal tissues.

4. It is equally safe. While making this assertion, he thinks it right to draw attention to the fact that it is merely an opinion and does not rest on a statistical foundation; there being no statistics available for the purpose.

The following special points as to the *technique* of suprapubic prostatectomy are founded on an experience of thirty-seven suprapubic cystotomies:

1. The quantity of water injected into the rectal bag, especially in cases where the prostate is abnormally hard, should be smaller than is usually recommended. Each case must be decided on its merits, but six or ten ounces are usually sufficient.

2. The bladder should be irrigated till the antiseptic solution used is perfectly clear. The quantity left in the bladder varies much, from ten to twenty or more ounces. The hand placed on the hypogastrium will show when the distention is sufficient.

3. In cases where the bladder is contracted with thick non-distensible walls, it will usually be inadvisable to perform this operation.

4. It is better to leave a catheter in the bladder till its cavity is opened, as it is a guide that expedites the operation. Care must be taken not to hook the peritoneal fold (superior false ligament) into the wound with the point of the instrument.

5. The linea alba is best divided* by incising it immediately above the symphysis, and then dividing upward on a director.

6. Care must be taken to secure the bladder before proceeding to remove the prostate. This is best done by inserting two sutures through each lip of the wound, and fastening it securely to the deeper part of the abdominal wall. When the operation is completed, a third suture passed through the lower angle of the wound is an additional security against urinary extravasation into the retropubic space.

7. The prostate should be removed as far as possible by enucleation with the finger, and not by cutting. The mucous membrane over the projecting portion having been snipped through, the rest of the operation is completed with the finger and forceps. In this way excessive hemorrhage is prevented. A pedunculated middle lobe can, however, be removed by cutting through its base. Hemorrhage is best arrested by irrigation with water so hot as to make it unpleasant for the hand.

8. A large tube should be inserted into the bladder, and the wound united above the tube by a deep and superficial row of sutures. The tube is to be removed in forty-eight hours.

9. The after-treatment consists in keeping the parts clean, and washing the bladder and the wound, in exceptional cases, with a boracic solution.

MR. EDWARD ATKINSON, who had been the operator in five of the twenty-four cases, strongly supported the conclusions of Mr. McGill. MR. JORDAN LLOYD had operated in three cases, MR. BENNETT MAY in four cases, MR. JESSOP in four cases. They also, in the main, indorsed the above propositions, Mr. May dissenting from the statement that suprapubic operation insures the most efficient drainage.

PAPILLOMATOUS URETHRITIS.

DR. F. M. BRIGGS reports in detail (*Boston Medical and Surgical Journal*, October 24, 1889) a case which he originally thought to be one of stricture of large calibre, but later, by endoscopic examination, proved to be one of papilloma, the urethra being studded for nearly five inches with growths of this character. He removed them by Oberländer's method, which he describes as follows:

He uses cotton tampons. The cotton is twisted firmly on the ends of tampon-holders. Having introduced an endoscope to the seat of the growths, he passes down two tampons one after the other, partially withdraws the endoscope and presses the two tampon-holders well against each other. The penis is stretched out, and the tampons, by an up-and-down, slightly twisting motion, ought to catch and pull off the growths. The tampons are withdrawn one after the other, and some papillomata will be adhering to the cotton.

Fresh cotton is reintroduced to the same spots to remove the growths still

there, and this is repeated at the various diseased points of the urethra, until as many growths as possible have been removed. One week later he examines again, and during this time many of the growths which were loosened by the tampons but were not removed, will have been carried out by the stream of urine. If any are left, he repeats his operation (which he calls "tampon-écrasement"), and, if necessary, does so a third time. In regard to these cotton tampons, his directions for making them are as follows: "In order to get a sure result, the tampons must have a definite size, and indeed, such that in the movements among the condylomatous masses they take hold—that is, they can be passed through only with distinct pressure. They ought not to go through too easily or one removes too little; nor should they pass through with too much difficulty, for then one has not room enough in the urethra for two tampons going side by side."

As regards after-treatment, he says, that if symptoms persist after all the growths are out, they are to be treated on the principles of treatment for chronic urethritis, by sounds or by topical applications.

Dr. Briggs sums up:

The symptoms are those of chronic irritation of the urethra. But an accurate diagnosis cannot be made by the symptoms alone. An endoscope must be used and the urethra thoroughly inspected. The prognosis is good; and, for treatment, the writer would recommend, as being both rapid and effective, the removal of the growths through an endoscope with a curette and cotton tampons, in the manner described above. If after-treatment is necessary, injections of permanganate of potash for several weeks. If this is not sufficient, then sounds or topical applications of nitrate of silver.

EXCISION OF THE ANKLE-JOINT.

MR. ARTHUR NEVE details (*Edinburgh Medical Journal* for October, 1889) a case of caries of the epiphysis of the fibula with secondary disease of the ankle-joint, which he approached by the following unusual method: A large posterior curved incision was made down the anterior surface of the fibula for the lower three inches, then back across the heel at the insertion of the tendo-Achillis, and again up the posterior aspect of the tibia for three inches. On the outer side the flap thus marked out was carried down to the bone, and at the back it included the tendo-Achillis, but on the inner side it was only cutaneous. The deeper structures on the inner side—tendons, vessels, and nerves—were dissected off the bone, and turned forward just as is done to certain structures behind the internal condyle of the humerus in excision of the elbow-joint: in the ankle with less difficulty. With the foot powerfully flexed, the posterior surface of the ankle-joint and astragalo-calcaneal joint was then easily accessible. The lower end of the fibula being removed with bone forceps, and the lateral ligaments cut, the whole joint could be inspected. The synovial membrane and various foci of disease were removed. Mr. Neve thinks that, compared with the operation by lateral incision and the anterior incision recommended by Jacobson, it has the following advantages:

1. It gives good visual access to every part of the ankle-joint.
2. Also to the bones composing the joint.

3. As well as to the astragalo-calcaneal joint and upper surface of the os calcis.

4. If the astragalus requires to be excised, no incision would serve the purpose better.

5. The anterior portion of the incision may be made as a diagnostic measure before cutting the flap.

6. The structures cut can be sutured without materially interfering with the strength, utility, or vascular ability of the foot.

7. The wound drainage is dependent.

THE TREATMENT OF HYDRARTHROSIS BY PUNCTURE AND INJECTION.

DR. FALCOZ reports (*Archives Générales de Médecine*, September, 1889) the following method of treatment as having been successfully employed in the service of M. Blum, at the Hôpital Tenon, in cases of hydrarthrosis, whether due to rheumatism or to traumatism:

The diseased joint is first carefully washed with soap, then with sublimate, and in the last place with a mixture of alcohol and ether. A small trocar is used, having first been heated, washed in carbolic water, and then oiled. The joint is punctured from the outside. The synovial fluid is then drawn off and the joint is washed out with carbolic lotion 1 : 20, about 60 c.c. being injected. This fluid is drawn off, the articulation emptied, and the carbolic solution again injected precisely as before. The small opening made by the trocar is occluded by means of a little collodion and the limb is placed in a plaster dressing. At the end of two days the dressing is removed, and if a little of the fluid still remains, energetic compression is applied. It is very seldom the case that after the second dressing, and after a little massage, the limb does not resume its normal state.

Dr. Falcoz summarizes his results as follows: Of 16 hydrarthroses, 13 resulted in complete and permanent cure; 1 of the remaining 3 had an acute arthritis; 1 was treated with tincture of iodine; 1 was still under treatment.

Ten hydrarthroses were treated by simple puncture and 6 by puncture followed by antiseptic washings. One of these hydrarthroses was particularly interesting, inasmuch as the simple puncture brought no favorable result, but the patient was completely cured by puncture followed by injection of the joint.

The conclusion seems justifiable, that the treatment by puncture and injection, inefficacious in cases of acute arthritis, always succeeds in chronic hydrarthrosis. Whether the hydrarthrosis originates under the influence of rheumatism or traumatism is of little importance; the essential factor is that there should be no acute inflammation in the joint, in order that after having freed the articulation of its liquid (as of a foreign substance) the irritating properties of the carbolic acid solution may prevent its re-formation. The operation, without being in the least complicated, exacts very rigorous antiseptic precautions, neglect of which in a hydrarthrosis treated by puncture and injection, could easily transform a simple chronic hydrarthrosis into a purulent arthritis.

OTOLOGY.

 UNDER THE CHARGE OF

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 AN ANTHROPOLOGICAL STUDY OF THE AURICLE.

DR. J. GRADENIGO, of Italy, presented a paper on the above subject at the last International Congress of Otology and Laryngology. (*Annales de Maladies de l'Oreille*, September, 1889.)

Two classes of individuals have been examined in these studies, viz., those termed normal individuals, and those classed as insane and criminal.

Besides a critical examination of 650 individuals (350 men, 300 women), Gradenigo examined 25,000 people cursorily, at Turin, viz., 15,000 men and 10,000 women, by a system of observation and noting in large crowds. These came under the first group of so-called normal people.

For the second group, the insane and criminal, necessarily fewer individuals were examined, as follows: 330 insane (180 men, 150 women), 76 crétins (50 men, 26 women), 120 typical criminals (82 men, 38 women).

The principal types were classified as follows:

I. Adherent lobes, simple or elongated; under this head is included absence of the lobule.

II. Prominent auricles (*oreilles à anse*), with varieties.

III. The "Wildermuth ear," in which the auricle is characterized by a prominence in the anthelix greater than that in the helix.

IV. The "Macacus ear," in which is found an uncurved and pointed helix at the upper posterior edge (something like the "pointed ear" of Darwin).

V. Combination of the adherent lobe with the prominent ear (*à anse*).

VI. Combination of the adherent lobe with the "Wildermuth ear."

The results are as follows:

	Men.	Women.
Adherent lobes . . .	28 per cent.	22 per cent.
Prominent ears (<i>à anse</i>) .	12.15 "	6 "
Wildermuth ears . . .	6 "	9.12 "

Prominent ears, therefore, are half as frequent in women as in men, whereas the "Wildermuth ear" is more frequent in women. It is furthermore stated that the percentage of anomalies of the auricles varies according to the country, the city, the social position, and even the age. Thus prominent ears (*oreilles à anse*) are found in 25 per cent. of children, while in adults only 12.15 per cent.

 INVESTIGATIONS AS TO THE HEARING OF SCHOOL CHILDREN.

The *British Medical Journal* of September 28, 1889, in commenting upon investigations of Dr. Thomas Barr, of Glasgow, as to the hearing of school

children, gives the following results of similar investigations in different countries:

	Children examined.	Found defective
Sexton, New York	570	13.00 per cent.
Weil, Stuttgart	4,500	33.37 "
Mourc, Bordeaux	1,768	17.0 "
Bezold, Munich	1,885	22.0 "
Barr, Glasgow	600	27.66 "

Dr. Barr found "twice as many with defective hearing among backward children as among forward children." His conclusions are:

"1. Teachers should keep in view the fact that in every class of fifty children there are probably about a dozen or more who have some defect of the hearing, and are, therefore, placed at a disadvantage as compared with their normally hearing fellows.

"2. Children who are known to suffer from defective hearing should always occupy a position on the bench nearest the teacher; and if the defect is limited to one ear, the child should be placed so that the better ear shall be turned to the teacher.

"3. Children whose hearing is extremely defective, or who are totally deaf, should not be placed in the ordinary classes, but should be taught in a separate class by one who is qualified to teach the German method of articulate speech and lip-reading.

"4. In cases of children whose progress is unsatisfactory, and who are inattentive, dull, and idle, the capacity for hearing should be ascertained by proper tests, and if defective hearing is found, information of the fact should be sent to the parents, and the children's position in the class so arranged as to minimize the bad effects of defective hearing.

"5. If the ear disease from which a child suffers is attended by a discharge of matter from the interior of the ear, the child should cease to attend school until a doctor's certificate of fitness is furnished by the parents.

"6. In all schools the head-masters should issue stringent instructions to the assistants or pupil teachers, that boxing the ears must never, on any account be practised on children.

"7. In the construction of new schools, it is desirable that the class-rooms should not exceed twenty feet in length or breadth, or better, that their shape should be that of a parallelogram, with a long side of twenty-five feet and a short side of fifteen feet, the teacher occupying the position of centre of one of the short sides, and that the number of scholars in one class and room should not exceed fifty. If, as is frequently the case, the teacher stands in the centre of the parallelogram, especially in a long room, the children to the right and left are badly situated for hearing.

"8. In the selection of a site for a new school, a position should be chosen as far removed as possible from noisy works or main thoroughfares; the class-rooms should be situated as far as practicable from the public streets, and they should not lead directly off main staircases.

"9. The wall separating class room from class-room, or from a staircase, should be sufficiently thick, and of such material as to form bad conductors of sound. Wood, especially fir, is obviously unfitted for entering into the construction of such partition-walls.

"10. In order to guard against colds in the head, a common source of deafness in school children, class-rooms should be supplied with sufficient appliances for ventilation to do away with the necessity for opening windows when the class-rooms are occupied by the children."

ON APROSEXIA, BEING THE INABILITY TO FIX THE ATTENTION, AND OTHER ALLIED TROUBLES IN THE CEREBRAL FUNCTIONS CAUSED BY NASAL DISORDERS.

This was the title of an interesting paper read by DR. GUYE, of Amsterdam, in the Otological Section of the British Medical Association, at Leeds, August, 1889 (*British Medical Journal*, September 28, 1889). The author said that for a long time past he had "made a point of studying the impairment of the cerebral functions by disorders of the nose," and he has given the name of "aproxexia" to one of the symptoms, which seems to be, next to headache, the elementary and generally the initial symptom. Aproxexia is the inability to fix the attention on any definite, more or less abstract, subject. It is claimed that "it is with aproxexia as with giddiness in aural vertigo." If ear patients are asked whether they suffer from giddiness, the surgeon will receive an affirmative answer in many cases, perhaps in the majority. If he examine carefully he will find, where giddiness is present, a relation between it and the ear disease. So a number of cases of nasal obstruction may be treated on account of secondary *aural* or *laryngeal* lesions, but aproxexia will not be found out unless inquired for. The aurist will be astonished at the number of cases of aproxexia if he inquires for them. It is of more importance still that medical men in general practice be impressed with the frequency of that relation, and that they make it a rule in every case of habitual headache and inability to work, and loss of memory, to inquire after the state of the nose, and to ascertain if the normal nasal respiration be not impeded, and habitually or temporarily superseded by breathing through the mouth.

A number of cases are then given of headache and inability to study, cured permanently by local treatment of the nose and naso-pharynx, which restores the normal nasal respiration. The majority of cases were boys and young men.

Aproxexia as a symptom of cerebral exhaustion is thus explained by Guye: This exhaustion must be due either to the fact that the nutrient matter required for repair in the brain is not sufficiently procured or assimilated, or the products of the "tissue-change" which have to be eliminated are incompletely removed. This removal will have to take place, partly, at least, by means of the lymph vessels. Now, large lymph vessels leave the cerebral cavity, together with the fibres of the olfactory nerve. "It is highly probable that structural changes in the nasal mucous membrane, and especially such as will exert pressure on the lymphatics, will impair or prevent the current of the cerebral lymph through the nasal mucous membrane. The retention of the products of the chemical processes in the tissues of the brain will lead to results which we may expect to be the same as those of physiological exhaustion—that is, fatigue."

Beside structural changes, local hyperæmia, often seen as a nasal reflex, will be apt to produce the same pressure on the lymphatics.

Headache, often found in disorders of the nose, is thus explained: "The air contained in the cavities communicating with the nose will be reabsorbed, and so its pressure diminished, as soon as its free communication with the nose is impaired by the swelling of the mucous membrane inducing a hyperæmia *in vacuo*."

Three forms of aprosexia are enumerated—viz.: 1. Physiological aprosexia, the result of cerebral overexertion or fatigue. 2. Neurasthenic aprosexia, where the cerebral exhaustion is produced by abnormal irritability and restlessness; and, 3. Pure nasal aprosexia, where the exhaustion is produced by the retention of products of tissue-change. Then follow some directions as to treatment, consisting in the application of astringent sprays to the nose, cauterization of the turbinated bodies with nitrate of silver, and the removal of cartilaginous obstructions by surgical operation.

ON SOME CAUSES OF BACKWARDNESS AND STUPIDITY IN CHILDREN.

MR. WILLIAM HILL, of St. Mary's Hospital, London, read in the Section of Otology, British Medical Association, Leeds, August, 1889, a paper with the above title, and bearing on the subject of the foregoing paper. He said: "The fact that children the victims of nasal and pharyngeal obstruction often suffer from headaches, especially when engaged in study, and frequently evince marked inability to fix the attention on their lessons or work for any length of time, has in recent years led many to suspect that these symptoms were not altogether due to the deafness . . . but were in part a reflection of some evident hampering of the cerebral functions."

The author's views as to the physical origin of aprosexia agree with those of Guye. He goes a step further, however, in his explanation, as follows: "Ferrier has pointed out that extirpation of the prefrontal lobes in monkeys is followed by a marked impairment of the faculty of attention and observation, and it is not unreasonable to suppose that aprosexia and other symptoms associated with lymphoid overgrowths and obstructions in the nose and pharynx are the outcome of lymphatic and venous stagnation and tension in the structures occupying the anterior region of the cranium." He also found that idiots, excepting the hydrocephalic, with low, sloping foreheads, indicating a small size of the anterior lobes of the brain, are nearly all mouth-breathers, and victims of some form of nasal or pharyngeal obstruction. "Many are deaf, all are aprosexic."

He then propounds the question: "Do want of cerebral development on the one hand, and morbid conditions of the nose and pharynx on the other hand, in strumous and syphilitic subjects, have a casual or a causal relationship? Does lymphatic stagnation within the cranium, as the result of hypertrophy and abeyance of the secretory functions of the tonsils and other lymphoid glands of the nose and throat, interfere with cerebral development and function?" If this question can be answered in the affirmative, it behooves physicians to pay more attention to nasal and pharyngeal lymphoid obstruction in very young individuals, if the number of deaf stupid children is to be lessened.—*British Medical Journal*, September 28, 1889.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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INTRA-LARYNGEAL AËRIAL CYST.

DR. G. LEDDERHOSE reports a case (*Deut. Zeitsch. f. Chir.*, 1889, Bd. 29, H. 4, S. 411) in which he performed laryngotomy to remove an aërial cyst composed of the ventricle of the larynx. Four years before, in the twenty-sixth volume of the *Zeitschrift*, he had reported a case of aërial cyst the size of a child's fist on the right side of the throat of a man fifty-eight years of age. The cyst was readily dispersed by pressure, but reformed under speaking, coughing, and swallowing. It was regarded as an extra-laryngeal prolongation of the right laryngeal sac, a formation analogous to the upper portion of the so-called laryngeal sac of the gorilla. As great dyspnoea was produced whenever the sac filled with air, and especially at night, it was extirpated by Prof. Lucke after ligaturing its pedicle, which protruded from the larynx through the hyothyroid membrane.

There was also a second tumor seated sessilely on the right inner wall of the larynx. It was of the bulk of a hazelnut, and its upper wall was lost in that of the right aryepiglottic fold. On puncture through the mouth on several occasions, it discharged air and clear colloid-looking material.

In February, 1889, the patient complained of suffocative attacks occurring regularly during sleep, so severe on several occasions as to have required artificial respiration to revive him. On examination the external wound gave no signs of a recurrence. The intra-laryngeal tumor projected beyond the median line and stretched back posteriorly into a fold of membrane which swayed back and forth in the phases of respiration. On splitting the larynx open, after preliminary tracheotomy, the tumor was found to have collapsed completely and to lie as a loose sac on the border of the epiglottis. It was surrounded with a ligature and then cut out at its base.

The intra-laryngeal tumor was a protrusion of the upper end of the laryngeal sac, the outer wall of which was in part formed of the hyothyroid membrane.

In accounting for the suffocative attacks at night and freedom therefrom in daytime, the author advances the theory that during daytime the sac continued distended with air, which kept it above the glottis; but at night, after a long rest from speaking, coughing, or swallowing, the sac collapsed, and either fell over the glottis or between the vocal bands, and thus obstructed the air-passage.

A cyst of the laryngeal sac projecting both externally and internally is unique in the history of lesions of the larynx.

FATAL HEMORRHAGE BY EROSION OF THE INNOMINATE ARTERY AFTER TRACHEOTOMY.

In an article by PROF. FRIEDR. GANGHOFNER (*Prager med. Wochenschr.*, Nos. 16, 17, 1889), he first reports an instance occurring in a girl seven years of age, on the eleventh day after an inferior tracheotomy for diphtheria. Everything was going on well apparently, when suddenly a stream of blood issued from mouth, nose, and canula, literally deluging the patient, and producing death in a few minutes. There was a small ulcerated perforation in the centre of the circumscribed thinned and browned area of the innominate artery just beneath the departure of the right subclavian. The injury had been caused by the canula.

A second case of death by hemorrhage twenty days after inferior tracheotomy for diphtheria in a child four and a half years of age is also reported. Here profuse hemorrhage suddenly took place from beneath the wound, and ceased on the occurrence of complete apnoea after removal of the canula. Artificial respiration was practised; but with the commencement of the restoration of breathing profuse hemorrhage recurred, with death in convulsions in a few minutes. An erosion was found on the median wall of the innominate artery directly opposite the departure of the right subclavian. In this case there was an abnormal origin to the left carotid and to the right brachio-cephalic trunk; both vessels springing from a common trunk which appeared to elevate the position of the innominate a little.

These two cases occurred in rapid sequence; although in the year previous, out of 165 tracheotomies, but one death had occurred by hemorrhage, the source of which was not ascertained because a post-mortem examination had not been permitted.

Ganghofner then reproduces a number of similar cases from the journals, and concludes that erosion of the innominate is a danger always to be dreaded in inferior tracheotomy on account of the frequent anomalous origin of the artery, by reason of which it crosses the trachea at such a high point as to be exposed to friction by the canula. Furthermore, the descent of pus from the inferior angle of the tracheotomy wound may extend to the vessels and result in ulceration of its walls without any injury from the canula.

Attempts have been made to avoid these dangers by the use of hard-rubber canulas in place of metallic ones. Even this does not always succeed, inasmuch as the curve of the canula may become changed by long usage.

[It may be permitted the compiler to state that he has never met with an accident from erosion by the canula, whether of the mucous membrane of the trachea or of the innominate, and that he has always performed the inferior tracheotomy when not contraindicated. He early adopted the rule of changing his canulas every day, using canulas of different lengths on the alternate days, the smaller of the pair in use being no longer than is absolutely necessary for secure engagement in the vertical axis of the trachea, and the other but a few millimetres longer. In this way permanent friction at any one point is avoided, even when the canula touches the tracheal surface. Care is always taken to provide a canula which shall play freely in the trachea without impinging on its walls. In city practice a suitable canula can always be made in a day or two, and meanwhile the plate can be so propped in any direction as to clear the extremity of the canula from the wall of the trachea.—ED.]

ELECTROLYTIC TREATMENT OF CHRONIC PHARYNGEAL CATARRH.

KAFEMANN, of Königsberg, extols (*Deutsche med. Zeitung*, No. 70, 1889) electrolytic treatment of the lymphoid nodules of the pharynx and of the salpingo-pharyngeal indurations, by a combined electrocaustic and electrolytic treatment somewhat more intense than that recently advocated by the lamented Voltolini. He uses shorter and stronger needles than Voltolini did, and in greater numbers. For the lymphoid nodulations in the pharynx he employs two insulated wires bound together, each of which is tipped with two or three gold points two millimetres in length. For the salpingo-pharyngeal thickenings, the ends of each wire are bent at a right angle and soldered to a plate of metal four millimetres in breadth, which is armed on both sides with six gold points three millimetres in length. The instruments are carefully insulated up to the gold point. With these electrodes an intense and efficacious multiple electrolyto-caustic effect is produced in a short time, say from ten to sixty seconds, according to the irritability of the parts and the density of the morbid tissues. The different effects of the positive and negative poles of the electrode are beautifully exemplified in this method of electrolysis; the dry, hard, and black eschar from the positive element being in marked contrast to the adjoining moist, soft, and white eschar of the negative element. The tissues between will have undergone some amount of electrochemical decomposition. The method is much less painful and protracted than electro-cauterization, and requires no more frequent repetition; and, from personal experience, we can, in the majority of cases, safely commend it in preference.

SYPHILITIC STENOSIS OF THE PHARYNX.

B. FRAENKEL presented to the Laryngologische Gesellschaft zu Berlin, 10 Mai, 1889 (*Deutsche med. Wochenschr.*, No. 32, August 8, 1889), a lad, seventeen years of age, with an adhesion of the soft palate to the posterior wall of the pharynx, and, in addition, with a membranous adhesion between the base of the tongue and the posterior wall of the pharynx. When the patient came under Fraenkel's care there was a membrane spread out between the base of the tongue and the wall of the pharynx. The orifice was so contracted as barely to permit the passage of the head of a probe. There was marked stridor. Solid nutriment could not be swallowed. The membrane was split, and a tolerably large opening made, through which the stump of the epiglottis was seen, about the size of a bean. Ulceration ensued, destroying the membrane and the stump of the epiglottis. When this healed, it left a membranous cicatrix between the root of the tongue and the posterior wall of the pharynx, with a central opening smaller than a bean. This was split with the knife and dilated with bougies. When the opening exceeded a certain size, aliment escaped into the larynx; and, therefore, although stridor occasionally occurs, it became necessary to keep the opening no larger than was necessary for respiration. As the patient had had a syphilitic wetnurse, it was not possible to determine whether his own syphilis had been congenital or acquired.

EXTENSIVE KERATOID PAPILLARY GROWTH OF THE NARES.

O. V. BUNGER, of Halle, describes (*Deutsche med. Wochenschr.*, August 28, 1889) an extensive hard papillary tumor of the upper portion of the nasal passages, preceded by psoriasis of the mucous membrane in a long-standing case of ozæna. The patient, a man, sixty-five years of age, had two severe wounds of the nose in childhood. Since puberty he had suffered continuously with ozæna. For six months his nose had been gradually becoming more and more occluded upon both sides, so that he was compelled to breathe permanently through the mouth. The skin of the dorsum of the nose was circumscribedly reddened and infiltrated. Both nasal passages were completely occluded by a peculiar tumor, which was characterized by its hard consistence, dendritic division, and white surface. It was larger than a hen's egg. It completely filled the upper portion of the nasal cavities, reaching from the orifice to beyond the choana, so that it could be distinctly felt behind the soft palate. Its lower margin lay anteriorly one and a half centimetres above the nasal apertures, on both sides of the septum, so that the tumor at this point invaded but little the zone of mucous membrane covered with squamous epithelium. It had produced by pressure a perforation of the cartilaginous septum as large as a three-cent piece. The glands in the lymph territory of the nose were not swollen.

After removal of considerable quantities of overlying sebum-like masses, the tumor presented an appearance analogous to that of hard and dry condyloma of the penis. The infiltrated portions of the soft palate of the dorsum of the nose soon broke down and became perforated by the pressure of the tumor from within, so that it became necessary to remove it. Prof. von Volkmann split the nose in the middle line, after the method of Dieffenbach, nasal bones included. The infiltrated soft parts of the dorsum were excised in oval incisions, and the tumor was separated with the scissors from both sides of the septum, and then carefully detached from the ethmoid bone, into the cells of which it had penetrated so far that the greatest caution was necessary to avoid making an entrance into the cavity of the skull. At no point did the tumor involve the anterior wall of the nose or the lateral walls. The greatest portion of the septum, except its inferior portion and a small strip posteriorly, was cut out, and the cavity was tamponed with iodoform gauze. The external wound readily united, there was no reaction, and the patient was discharged cured on the nineteenth day. For three months later, small continuous recurrences presented in the nasal passages, but for seven later months the patient had remained free.

A number of interesting histological changes were noted in the mucous membrane of the septum, for details of which the original article must be consulted. We will mention a change into squamous of the cylindric and ciliated epithelium of the entire upper portion of the nasal cavity.

CROUPOUS FIBRINOUS RHINITIS.

DR. SEIFERT, of Wurzburg, has related (*Deutsche med. Wochenschr.*, August 8, 1889) an instance in a man, seventy-one years of age, under treatment for ichthyosis, and in whom, at the close of a pneumonia, a fibrinous exudation

occurred on the mucous membrane of the bronchi, trachea, larynx, pharynx, and nose. Tracheotomy was of no avail, death having occurred twenty-four hours after the operation. The microscopic preparations showed merely a fibrinous exudation upon intact epithelium, by no means a diphtheritic membrane. The only microörganisms were colonies of cocci.

OSSEOUS OCCLUSION OF THE CHOANÆ.

B. FRAENKEL has reported (*Deutsche med. Wochenschr.*, August 3, 1889) a case of complete bilateral occlusion of the posterior nares in a youth, eighteen years of age. The septum narium projects a little way into the cavity of the pharynx, located upon a yellowish wall which covers the passages like a curtain on both sides, and on which some ramifying bloodvessels are visible. The membrane can be seen from the front, likewise, as the turbinate bodies are atrophied. Palpation shows that the membrane has an osseous base. The patient cannot smell at all. Taste is very slight; sweets can be recognized, and occasionally bitters. The thorax is distended above and constricted below. A slight degree of essential emphysema exists.

COARCTATION STRICTURE OF THE ŒSOPHAGUS WITH FISTULE.

DR. JUL. HEDDÆUS, of Idar, relates (*Berl. klin. Wochenschr.*, September 9-16, 1889) an interesting case of an agate-grinder who had consulted him from time to time since 1869 for various affections incident to his vocation. These included costal periostitis from pressure against his bench, with abscesses over the ribs and over the clavicles, pleuritis, and ulcerative pneumonitis. After having suffered with cough for a long time, he was seized almost of a sudden in May, 1888, with dysphagia, accompanied with painless retentions of solid food in the œsophagus. The sputa were occasionally hemorrhagic, and the cough so severe that it often led to emesis, with discharge of the entire contents of the stomach. A sound, thirteen millimetres in diameter, encountered a readily permeable obstruction of a few centimetres in length just above the bifurcation of the trachea. The difficulty increased, despite occasional improvements from the use of the sound. Laryngostenotic breathing came on, and the larynx no longer moved downward on inspiration. The sputa became colored like prune juice, and finally fluids swallowed escaped by the larynx, so that the patient recognized that a fistulous communication must have been made between the food-passage and the air-passage. When a catheter reached the point of stricture, air audibly passed through it on rapid expiratory movement or on coughing. The patient died November 6th.

The bronchial glands were diseased and purulent in front of the œsophagus and behind, and a fistule large enough to admit the end of the little finger was found between the œsophagus and trachea, both passages otherwise showing nothing pathological.

EMPHYEMA OF THE MAXILLARY SINUS.

DR. ALFRED FRIEDLÄNDER relates (*Berliner klin. Wochenschr.*, September 16, 1889) a number of cases from Krause's clinic, in which remarkable success was obtained in a few weeks by penetrating the antrum from the lower meatus

with a trocar, and methodic insufflations of iodoform after thorough syringing with a boric solution. Krause's method is as follows: After thorough cocainization of the meatus, the trocar is introduced with its tip directed against the exterior wall, until the canula presses, the membranous septum toward the opposite side of the nose, and then it is forced from one-half to one centimetre into the antrum. Experience has shown that this method of introduction places the trocar at the thinnest point of the osseous wall of the antrum, and renders it easy to find the opening afterward. The penetration being made, the trocar is withdrawn, and the canula is connected with rubber tubing with a handball intervening. Then the antrum is syringed with a borax solution until all pus has been expelled through the natural opening in the nasal passage. When the solution flows clear out of the nose, the tubing is taken out of the solution and air is driven in until it escapes freely by the nose. The handball syringe is then withdrawn, and a powder-blower substituted filled with finely powdered iodoform, and this is propelled by twenty or twenty-five squeezes of the bulb, so as to cover the entire surface of the cavity with the powder. Should no more pus escape by the natural passages, no further syringing is done, but the insufflation of the powder alone is repeated at intervals of two days. Should pus continue to be discharged, the insufflation is preceded by syringing. Several cases appear to have been thoroughly cured by a treatment of two weeks' duration, or a little longer. Iodol powder did not produce as good results as the iodoform.

OBSTETRICS.

UNDER THE CHARGE OF

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CHOREA IN PREGNANCY.

JONES (*Transactions of the Obstetrical Society of London*, vol. xxxi., 1889) reports a case of chorea in pregnancy complicated by acute mania, which ceased after induced labor. The fœtus was at seven months and decomposed. An attack of sepsis followed emptying the uterus, from which the patient fully recovered.

Also a case of chorea in pregnancy, with delirium and delusions, followed by paralysis of the left arm. Complete recovery followed confinement. Excessive functional instability of the nerve centres was thought to be the pathology of these cases.

THE DETERMINING CAUSE OF LABOR.

GIRIN (*Archives de Tocologie*, No. 8, 1889) finds that the amniotic liquid attains its maximum density during the early months of pregnancy, when it

is 1.030. It diminishes steadily until term, when it is nearly that of water. The specific gravity of the fœtus is at first lower than that of the amniotic liquid, but becomes steadily higher. The fœtus, sinking to the os internum, excites the uterus to contraction by the reflex stimulation caused by pressure.

THE CAUSE AND EFFECTS OF RUPTURE OF THE MEMBRANES.

EISENHART (*Archiv für Gynäkologie*, Band 35, Heft 3) has studied this subject carefully in 2289 labors. His conclusions are as follows: the membranes rupture most frequently in primiparæ in the first stage of labor; then in the second, and finally at the end of the first, when the os is fully dilated. Up to the fifth labor the membranes rupture late in labor with multiparæ; in subsequent labors, earlier. Age is a factor with primiparæ, the older the woman the earlier rupture occurs. Contracted pelvis, a purulent discharge, anæmia, and tuberculosis, favor early rupture of the membranes; as does also eclampsia. Abnormal fetal positions favor early rupture of the membranes, partly because of increased tension, and also because of frequent examinations during such labors. As the child's weight increases, the membranes rupture later; short children often favor early rupture, as do twins.

Labor is longer in primiparæ the later the membranes rupture; in multiparæ shorter the later rupture occurs. The earlier rupture occurs the greater the suffering with the pains, and the stronger the reflex stimulation. Hemorrhage during the expulsion of the placenta in primiparæ is rare the later the membranes rupture; the reverse is true with multiparæ. Injuries to the maternal soft parts generally occur when the membranes rupture before the os is as large as half a dollar. Early rupture of the membranes most often leads to conditions calling for operative interference. Complications of the puerperal state are most frequent when the membranes rupture early. Macerated children generally rupture the membranes late; early rupture favors asphyxia.

RECURRENT ULCERATION OF THE CERVIX UTERI DURING PREGNANCY.

CHROBAK (*Centralblatt für Gynäkologie*, No. 36, 1889) described a case of induration of the cervix during pregnancy, with ulceration. Labor was induced at eight months, and the affected surfaces excised shortly after.

In a second pregnancy, two and a half years later, a similar induration appeared, followed by abortion at the tenth week, and the disappearance of the affection. Microscopic examination of the excised tissue showed new formation, which was probably syphilitic or cellular growth from the stimulation of pregnancy—cancer and tubercle were excluded.

THE TREATMENT OF OCCIPITO-POSTERIOR POSITIONS.

BATAILLARD (*Annales de Gynécologie*, August, 1889) has collected 400 cases of occipito-posterior positions; 353 of these cases became occipito-pubic positions by spontaneous rotation. In primiparæ when the child weighed from five to six pounds, labor was two hours longer than in anterior positions; from six to seven and a half pounds, it was three and a half hours longer. With multiparæ labor was shorter when the fœtus was comparatively large

The treatment employed when rotation failed was the introduction of the antisepticized hand to effect rotation; this usually dislodged the head from the sacrum, and if further rotation failed the forceps was applied to the sides of the head and rotation was completed. Tarnier's forceps was especially useful in these cases. The maternal mortality of these cases was 0.5 per cent.; of 660 contrasted cases of occipito-anterior position, 0.46 per cent.; foetal mortality in occipito-posterior positions was 2 per cent.; in anterior positions, 0.76 per cent. It was necessary to apply forceps at the superior strait in 6 per cent. more cases than in anterior positions.

FIBROMA UTERI COMPLICATING PREGNANCY; LAPAROTOMY; RECOVERY.

GORDON (*Boston Medical Journal*, October 17, 1889) reports the case of a primipara about three months pregnant, who suffered from severe pelvic pain on the right side. Examination revealed a small elastic tumor in the right side of the pelvis; the os and cervix denoted pregnancy. In the middle line above the pubes was a hard growth as large as a pregnant uterus at two months. Laparotomy showed an ovoid fibroid, with sessile attachment to the front of the uterus. The peritoneum was divided high up around the tumor and the mass was enucleated. The uterine wall was left very thin and vascular, but hemorrhage was controlled by stitching the peritoneum and base of the wound with fine catgut.

When the fibroid was removed, the fundus uteri, which had been displaced laterally, assumed its normal position. Recovery was rapid and pregnancy uninterrupted. At labor uterine pains were severe and the patient had several convulsions near the close of labor. Mother and child recovered well.

INCARCERATION OF THE GRAVID UTERUS AT SEVENTH MONTH, WITH SPONTANEOUS REPOSITION.

SPERBER (*Centralblatt für Gynäkologie*, No. 36, 1889) reports the case of a multipara in whom symptoms of retroflexion and incarceration of the uterus began at four months, with interference with the functions of the bladder and rectum, pain, distention of the abdomen, œdema of the lower extremities, followed by severe pain in the pelvis; a diagnosis of extra-uterine pregnancy was made. Careful examination, however, revealed a greatly distended bladder, with retroflexion and incarceration of the uterus. Apparent labor pains came on, which were relieved by opium; after uterine contractions had persisted forty-eight hours, spontaneous reposition occurred with the disappearance of the symptoms.

TWO RARE DEFORMITIES COMPLICATING LABOR.

STRAZALKO and ELIASBERG (*Centralblatt für Gynäkologie*, No. 34, 1889) report the case of a monstrosity complicating labor, which presented by the liver and intestines. Traction upon an arm delivered the fœtus, which lacked a portion of the posterior wall of the trunk; there was no pelvis, and no sexual organs. In a second case, the trunk was retained after the head was born. An ignorant attendant severed it by traction. Great ascites was found to be the cause of delay; a slender sharpened stick was passed through the

neck, through the thorax and diaphragm, and a free evacuation of fluid followed. The trunk was then expelled spontaneously.

HYDROCEPHALUS AND RUPTURE OF THE UTERUS.

HERZFELD (*Centralblatt für Gynäkologie*, No. 36, 1889) describes the case of a multipara brought to his clinic in collapse with uterine tetanus, the cervix dilated. The hydrocephalic head was perforated, two quarts of serous fluid evacuated, and delivery effected by the cranioclast. Rupture of the uterus in the left portion of the cervix, with prolapse of the intestine, was found after delivery. Drainage with iodoform gauze was made; the patient died in forty-eight hours from suppurative peritonitis. Post-mortem examination revealed uterus bicornis, with rupture and separation of the uterus from the peritoneum and broad ligament.

AN OBSTETRICAL STUDY OF THE LEVATOR ANI MUSCLE.

DICKINSON (*American Journal of Obstetrics* for September, 1889) contributes a well-illustrated study of the anatomy and action of the levator ani muscle. By introducing cylinders of modelling wax into the vagina and having the patient voluntarily contract the muscle by straining, he studied the contractions graphically with the following results: The distance from the vaginal orifice to the inner edge of the levator averages less than half an inch (1.2 c.m.) The double band of the muscle is always sharply defined. The more the levator is stretched the closer the strong edges of the horizontal belly are brought together. The contraction of the muscle crowds the penis against the cervix during coition; the vaginal outlet remains quiet, while the upper portion rises 15° or 20° toward the brim. A dynamometer test of the strength of the muscle gave an average of 10 pounds, occasionally 27. It is especially strong in muscular and erotic women, in those with wide pelves, and in those suffering from painful lesions about the vulva and vagina.

He adds two cases of laceration of the pelvic floor which illustrate the efficiency of the muscle in preventing rectocele, and has collected five cases of labor delayed by the spasmodic contraction of this muscle, to which he adds one from his own observation.

ABDOMINAL PREGNANCY, WITH OPERATION.

SACRÉ (*Proceedings of the Obstetrical Society of Brussels*, July 21, 1889) reported an abdominal pregnancy in a patient, aged twenty-two, who had ceased to feel foetal movements for a month. On laparotomy the foetal sac was divided into two parts, the anterior filled with dirty fluid, the posterior contained the foetus; the partition dividing the sac was adherent to the foetus. The sac was irrigated with boric acid, and stitched to the abdominal wall. Eight days after the operation a mass of feces was discharged from the sac, showing a fistula with the colon. Recovery ensued, the wound healing by granulation; at the time of reporting a small fecal fistula remained.

FRAIPONT (*Ibid.*) described two cases of abdominal pregnancy in which a decomposed foetus was found encysted in the abdominal cavity. The parietal peritoneum was adherent to the foetal sac. The placenta lay in front, and

an attempt to remove it caused hemorrhage. It was left, with the foetal sac, which was irrigated with mercurial solution and tamponed with iodoform gauze. Fever declined at once after the operation, and recovery followed in both cases in two months.

TUBAL PREGNANCY.

LUSK (*New York Medical Journal* for October 19, 1889) reports the case of a multipara suffering from attacks of cramps, nausea, and vomiting, with sero-sanguinolent vaginal discharge. Collapse supervening, the patient was conveyed to a hospital. Examination revealed the uterus pressed to the left, irregular masses of soft consistence to the sides and posterior to the uterus. Laparotomy revealed the pelvic cavity full of clots, dark fluid blood in the peritoneal cavity. The left tube was enlarged near the fimbriated end. Hemorrhage came from a sac in the broad ligament, ruptured into the peritoneal cavity. Tube, sac, and ovary were ligated and removed by thermocautery; the pedicle was dropped. The right tube and ovary were healthy. Abdominal irrigation and a large drainage tube were employed. Sero-sanguinolent discharge lasted for four days; recovery resulted. The embryo was six weeks old.

A second similar case recovered from the operation, but died eight days after from nephritis and uræmia. He also describes two cases treated by faradic electricity, the positive pole externally, the negative internally for five minutes by rectum and vagina twice daily. The tumors shrank to small size in a week, and complete recovery followed. One of the patients has since borne two children without complication.

CONCEALED PREGNANCY UNDISCOVERED BY LAPAROTOMY.

VANDER VEER (*Journal of the American Medical Association*, October 19, 1889) reports a case of multiple fibro-myxomata of the uterus extensively adherent to the bladder and intestines. Laparotomy revealed the impossibility of removing the mass. On the tenth day after operation the patient aborted (four months). Death from exhaustion ensued. Pregnancy could not be diagnosticated before abortion. Vander Veer has collected sixty-nine cases of pregnancy complicated by foreign growths in which pregnancy was not diagnosticated before operation; five cases of pregnancy in bicornate uteri not diagnosticated before operation; and eleven cases of pregnancy uncomplicated by new growths, which was not diagnosticated before operation.

THE TECHNIQUE OF CÆSAREAN SECTION.

VEIT (*Centralblatt für Gynäkologie*, No. 30, 1889) has found by experiments on animals and observations on the human subject that the peritoneum heals perfectly when not joined by turning its edges in by separate suture, as in Sängers's method; union takes place by the formation of cellular tissue between the incised portions. He would operate before pains become strong.

LEOPOLD thought it not always necessary to join serous surfaces separately, but had found them firmly healed seven days after operation. As regards the time of operation, he had operated six hours after pains began; the oper-

ation was typical, after Sanger's method. The patient died from intra-abdominal hemorrhage, the blood having oozed between the folds of serous membrane covering the incision.

CÆSAREAN SECTION FOR PRIMARY CARCINOMA OF THE VAGINA.

HAWLEY (*New York Medical Journal* of October 19, 1889) operated by Cæsarean section at seven and one-half months on a multipara suffering from primary carcinoma of the vagina. The mother died of sepsis from the cancer on the fourth day. The uterine incision had closed perfectly. The child died suddenly a few hours later. The mother was under observation several months, but operation was delayed in the child's interests.

CÆSAREAN SECTION FOR CONTRACTED PELVIS; CATGUT SUTURE; RECOVERY.

MÜLLER (*Centralblatt für Gynäkologie*, No. 39, 1889) reports a successful Cæsarean section (Sanger) in which all sutures were catgut. It was prepared in one per cent. bichloride of mercury; twenty-four hours in oil of juniper; twenty-four hours in glycerine; preserved in absolute alcohol.

AMPUTATION OF THE UTERUS FOR PREGNANCY AFTER CÆSAREAN SECTION.

KUFFERATH (*Proceedings of the Obstetrical Society of Brussels*, July 21, 1889) reported the case of a woman with highly deformed pelvis, on whom Cæsarean section had been done successfully. She became pregnant again, and on examination it was not thought safe to allow pregnancy to go to term for fear of rupturing the uterine cicatrix. The Porro operation was successfully made; the child died.

TWO PORRO OPERATIONS FOR HEMORRHAGE AFTER CÆSAREAN SECTION.

RUSS (*Archiv für Gynäkologie*, Band 35, Heft 3) reports two Cæsarean sections (Sanger) in Wyder's clinic at Zurich, in which persistent hemorrhage after the uterine suture had been completed made amputation of the uterus imperative. In each case the elastic ligature was used, and remained tightly drawn about the cervix for thirty minutes; hemorrhage followed its removal. The application of heat, uterine massage, and ergotine injections failed to secure uterine contraction. In the uterine amputation the cervical mucous membrane was excised; the stump was closed by heavy catgut; bleeding checked by Paquelin's cautery and by the separate ligation of bleeding vessels, and the peritoneum was stitched over the stump, which was dropped into the abdomen; no drainage was employed.

Both patients recovered; one had thrombosis of a vein in the thigh, which disappeared without serious consequences. Although other operators have allowed the elastic ligature to remain for thirty minutes without secondary hemorrhage, in these cases paralysis of the uterine muscle was probably produced by the ligature.

Russ also reports the case of a primipara pregnant with twins, whose labor was complicated by a myoma on the posterior wall of the cervix as large as a

fist. It was decided to allow labor to proceed spontaneously, in the hope that the tumor would be displaced by the head. As the expulsion of the first child failed, craniotomy was performed, followed by version and extraction of the second child, which survived.

The case illustrates the fact that cervical fibromata of moderate size are commonly displaced by the foetus, making spontaneous birth possible.

THE DEVELOPMENT OF PLACENTA MARGINATA.

KLEIN (*Centralblatt für Gynäkologie*, No. 40, 1889) believes that the decidua circumflexa becomes hypertrophied, forming a thickened ring, aiding in the nourishment of the villi, occasionally persisting until the end of pregnancy, and aiding in the formation of placenta prævia. This mass atrophies at the second month, forming a firm yellowish ring about the ovum at the placental border, forming ultimately placenta circumvallata, and, finally, placenta marginata.

THE PLACENTA IN EXTRA-UTERINE PREGNANCY.

HART (*Edinburgh Medical Journal* for October, 1889) has studied minutely the placenta in various forms of extra-uterine pregnancy, and concludes as follows: In tubal pregnancy the villi lie in decidual cells, no intervillous sinus system existing. Large sinuses are formed in the muscular wall, the villi are well formed, the decidual cells are large. In broad ligament placenta the villi are less perfect, blood is extravasated, the decidual cells are few. In abdominal pregnancy, the placenta in the pelvic connective tissue, there is an attempt at a placental sinus system; in abdominal pregnancy with extreme displacement of the placenta it becomes organized blood-clot, with distorted villi, no decidua and no villous sinuses.

In general the placenta in extra-peritoneal pregnancy is reduced to compressed villi, with blood-clot and crystals, without serotina.

The placenta develops best in the lower portion of the tube. The foetus perishes as the placenta becomes disorganized, and when foetus and appendages are near the bowel, intestinal gases and micrococci may cause suppuration.

ACCIDENTAL HEMORRHAGE.

SWAYNE (*Bristol Medico-Chirurgical Journal* for September, 1889) reports eleven cases of concealed hemorrhage, in ten of which the foetus perished. Three mothers died; alcoholism, septicæmia, and nephritis causing death. The abnormal presentations were the feet in two, the head and hand in one. Regarding treatment, three were delivered naturally. Barnes's dilators are often useful; ergot and rupturing the membranes are indicated. Delivery should not be forced, and precautions should be taken against post-partum hemorrhage.

THE TREATMENT OF POST-PARTUM HEMORRHAGE BY IODOFORM GAUZE TAMPONS.

GRAEFE (*Berliner klinische Wochenschrift*, No. 41, 1889) reports a case of atonic post-partum hemorrhage treated by intra-uterine tampons of iodoform

gauze. Hemorrhage was immediately checked, but uterine contractions were excited which expelled the tampon, when bleeding recurred. It was finally necessary to tampon the vagina and secure uterine contraction by massage and manual compression. Intermittent relaxation of the uterine muscle and expulsion of the tampon during contraction are thought to explain the failure of the tampon in this case.

PUERPERAL MASTITIS, COMPLICATED BY PYÆMIC PAROTITIS.

WENNING (*American Journal of Obstetrics* for September, 1889) reports a case of suppurative mastitis occurring three months after labor, in which high fever and parotitis with pyæmia resulted. The patient recovered with free drainage.

PUERPERAL INFECTION FROM DEFECTIVE SEWERAGE.

GUSTAVE BRAUN (*Centralblatt für Gynäkologie*, No. 36, 1889) ascribes a recent mortality in his clinic of 8.97 per cent. to bad sewerage. His wards are in direct communication with the sewerage system of the general hospital, and near the closets of an adjoining barrack. Technical antisepsis had been as faithfully observed as is possible where instruction is given to midwives.

THE TREATMENT OF PUERPERAL SEPTIC INFECTION BY ALCOHOL.

At a recent meeting of the Berlin Obstetrical Society, MARTIN (*Centralblatt für Gynäkologie*, No. 31, 1889) reported three cases of puerperal pyæmia and fifteen cases of puerperal septicæmia treated largely by the administration of alcohol in free doses. Thirteen of the patients recovered; three died of septic infection, one of pulmonary œdema, and one of tuberculosis. Half a bottle of cognac, a bottle of champagne, and a bottle of burgundy were often given daily, in addition to milk, eggs, and beef extract. Alcoholic intoxication was not observed.

GOTTSCHALK had treated four severe cases of puerperal septicæmia and one case of puerperal pyæmia with thrombosis and joint inflammations, by alcohol and forced feeding. General peritonitis was present in all the cases. Three of the cases of septicæmia recovered, and the case of pyæmia recovered after two months' illness. In the cases which recovered cocaine was very useful in favoring the retention of food. The duration of the cases was from fourteen days to five weeks. After disinfecting the genital tract the treatment consisted mainly in alcohol and easily digested food; from one to two pints of cognac were given daily, with wine in abundance in addition.

In one of the cases which recovered alcoholic intoxication occurred. The patient became actively delirious, but had a much better pulse. Black coffee was given freely, and an ice-bag put on the head for twenty-four hours. The intoxication was followed by marked improvement in the puerperal symptoms.

OLSHAUSEN considered puerperal septicæmia, infection manifesting itself one or two days after labor with rapid pulse and diffuse peritonitis, almost invariably fatal in spite of alcohol. Severe puerperal pyæmia often recovered spontaneously. While alcohol was a valuable agent in treatment, he

was not so confident as others in its efficacy. The majority of cases of puerperal infection tended to recovery.

A CASE OF ATROPHIC PELVIS FOLLOWING INFANTILE MYELITIS; AND
A CASE OF ATROPHIC PELVIS FOLLOWING PARALYSIS OF ONE EXTREMITY.

BLANC (*Archives de Tocologie*, No. 9, 1889) reports for comparison the two cases enumerated above. The pelvis in the former was comparatively large, and maintained in the main a circular contour. The latter pelvis had one normal half, while the other was greatly lessened in its antero-posterior measurement, resembling an obliquely contracted pelvis. Blanc concludes that there exists an atrophic pelvis, as in infantile paralysis, and also an atrophic pelvis caused by paralysis of a lower extremity; the first comparatively simple in contour and causation; the latter resulting from complex forces occasioned by paralysis of a limb and resulting derangement in the mechanism of pelvic development.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE CONDITION OF THE CORPOREAL ENDOMETRIUM IN CARCINOMA OF THE CERVIX.

ABEL and LANDON (*Archiv für Gynäkologie*, Bd. xxxv. Heft 2), after making numerous careful microscopical studies, arrive at the conclusion that in cases of cancer of the cervix the corporeal endometrium nearly always undergoes marked changes, which are of a malignant, as well as of an inflammatory, character. The histological structure of the diseased endometrium is often identical with that of round-celled sarcoma, which is to be regarded as the initial stage of cancer metastasis. The practical lesson to be derived from this is that, since in a given case of cancer of the cervix uteri the surgeon is entirely ignorant of the true condition of the corporeal endometrium, he ought not to be satisfied with high amputation, but should remove the entire organ.

[There is another question to be taken into consideration in deciding as to the relative merits of high amputation and complete extirpation in cases of cancer of the portio vaginalis, which is of more importance than the doubtful condition of the corporeal endometrium, and that is the state of the perimetrial tissue. Deductions based upon microscopical observations alone can hardly outweigh the well-established clinical fact that recurrence of the disease after high amputation occurs in the majority of the cases at the edges of the former wound, and not within the body of the uterus—it *extends from*

below upward. It should not be forgotten that competent observers have failed to find the changes above described.—ED.]

VENTRO-FIXATION OF THE UTERUS.

F. SPAETH (*Deutsche med. Wochenschrift*, September 12, 1889) discusses this subject at length, reporting fifteen cases in which the operation was performed successfully by Prochownick. He thinks that it is indicated in about seven per cent. of the cases of retro-displacement, *i. e.*, in women with retroflexed and adherent uteri, who still menstruate. Temporary vesical irritation was noted in several cases, but no more than after ordinary laparotomies. The results of ventro-fixation cannot properly be estimated until years have elapsed. Even after a few weeks there may be some tendency to backward displacement, but the most important point is that the patient's symptoms are relieved.

A NEW METHOD OF PERFORMING VAGINAL HYSTERECTOMY.

ZUCKERKANDL (*Wiener med. Presse*, 1889, No. 7) suggests the following method of reaching the internal pelvic viscera through an opening in the perineum: The patient being in the knee-chest position, a transverse incision is made in the perineum, at the outer extremities of which lateral incisions are made, as in the flap-operation (\backslash _____/ \swarrow). The fibres of the external sphincter which extend to the commissure are divided, and the lower portion of the vagina is separated from the rectum, the attachments of the levator ani being divided on each side. The rectum is drawn backward, and the wound is opened up as high as Douglas's pouch, the posterior fold of peritoneum then being incised. Through this opening the fundus uteri is grasped, and the organ is retroverted. The broad ligaments are tied in sections, the bladder is dissected off, and finally the vaginal attachments are separated. The stumps of the broad ligaments may be returned to the cavity, the peritoneal wound being closed by sutures, or they may be stitched into the vaginal wound.

The writer claims that by this method the whole of the broad ligaments may be inspected before the ligatures are applied, and that the ureters may be seen and avoided, while the posterior vaginal wall is uninjured.

[We can hardly conceive what advantage is to be gained by complicating this operation through the addition of an extensive wound in the perineum. Any one who has tried to separate the bladder from the uterus from the peritoneal side, will appreciate the difficulties of the procedure, and the impracticable nature of the entire operation.—ED.]

THE TREATMENT OF MALIGNANT TUMORS OF THE OVARY.

FREUND's paper on this subject (*Zeitschrift für Geburtshülfe u. Gynäkologie*, Band xvii., Heft 1) is based upon his experience in seventeen cases in which the malignant neoplasm was localized in the ovaries, and eight in which the peritoneum was also affected. He lays considerable stress upon the presence of hydrothorax as evidence of malignancy of the tumor; this was noted in ten cases, in only one of which it could be ascribed to actual metastatic disease of the pleura. This hydrothorax is no counter-indication to laparotomy; in

fact, the fluid rapidly disappears after the operation. This effusion accompanies papillomata of the ovaries, as well as carcinomata and sarcomata.

In three cases the umbilicus was the seat of cancer, thus rendering the diagnosis easy. Secondary growths on the adjacent peritoneum are not true metastases, but represent rather a sort of implantation of the original neoplasm; this distinction is of great importance clinically, since secondary tumors around the uterus do not contra-indicate operative interference—an opinion directly opposed to that expressed by Schröder. This applies to all varieties of malignant neoplasms of the ovaries.

With regard to the propriety of operating in these cases, the writer insists upon the similar course of malignant disease of the pelvic organs and that of the breast or extremities; the patient may live for years, so long as the functions of the important viscera are not disturbed. Even when the latter are affected, the surgeon may prolong life by removing ascitic and pleuritic effusions, breaking up intestinal adhesions, etc. Laparotomy is preferable to puncture in the treatment of cancerous ascites, as in that due to tuberculosis, because not only can the fluid not be entirely withdrawn by the aspirator, but there is more danger of hemorrhage and collapse. If fluid remains in the cavity, it irritates the peritoneum, and thus leads to fresh effusion. No one should attempt to remove these malignant growths who is not competent to treat all the formidable complications which arise in abdominal surgery, including resection of the intestine. The after-treatment of these cases requires unusual care. There is no more reason to fear septic peritonitis than there is after a simple ovariectomy.

The writer's results were very favorable, since he lost only one patient from pulmonary embolism.

THE DIAGNOSIS AND TREATMENT OF PAROVARIAN CYSTS.

WYKOWSKA (*Centralblatt für Gynäkologie*, October 12, 1889), from an analysis of seventeen cases, finds that there are wide differences in the anatomical structure and contents of these cysts; in only two cases did the fluid contain ciliated epithelia. In one-half of the cases circumscribed peritonitis was present. He recommends puncture *per vaginam* in preference to removal by laparotomy, but acknowledges that the diagnosis is often doubtful.

[We have quoted this article only to express disapproval of the palliative treatment advised, which is opposed to that which is generally accepted.—Ed.]

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